# Chapter - 1

## Introduction to Pharmaceutical Sector

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Chapter -1

Introduction to Pharmaceutical Sector

1.0 Introduction:

The pharmaceutical products mainly consist of two components i.e. Active Pharmaceutical Ingredients (API) or Bulk Drug and Formulations. While APIs are either produced by chemical synthesis or are of plant, animal or biological origin, formulations are suitable for final dosage. For the pharmaceutical industry patents for manufacturing and marketing a pharmaceutical product are critical aspects. A pharmaceutical company can obtain patent for a new drug molecule, or for a new drug delivery system of an existing product, or a new indication of an existing molecule. The World Trade Organization has decided to enforce a product patent life of 20 years in all the countries. It means that if drug development and FDA approval takes 10 years from the first disclosure of the molecule, a pharmaceutical company gets exclusivity of 10 years to market the formulations. The excessive cost of drug development forces the drug prices to remain high. The prices of drugs vary from country to country. The people of developing countries cannot afford high prices of drugs. Therefore, multinational companies must sell their products at low prices in the developing countries otherwise; they will have to face the problem of piracy or duplication of the drugs.

Indian Pharmaceutical Industry has been growing at a record high level in the recent years and it is showing unprecedented growth opportunities to expand the sector. Domestic industry’s long established position of the growth leader is attracting the developed and developing countries of the world. More and more governments worldwide are seeking to curb the India Market. India has become preferred manufacturing location for multinational drug manufacturers. Increasing cost of R & D and administration in other countries are attracting more and more drug manufacturers to shift their manufacturing location to India.

Both multinational and domestic drug manufacturers could get benefit from market potential of increasing population of India. Such a large market of the population over a billion will open up several opportunities for these companies. Even greater opportunities are created for these companies by favorable government policies. The
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Fast development of urbanization, growing number of middle class families, fast paced lifestyle, westernization, wealthy lifestyle, etc. have created lifestyle related illnesses, for which these people want and can afford innovative drug treatment. Such a large market and such a large number of opportunities are still untapped and that are attractive for the multinational and domestic companies. The multinational companies are returning to India and they have started working together with the domestic companies. With all such advantages, there are some uncertainties and limitations also with the Indian market.

Thus, the Indian Pharmaceutical Industry has passed through stages of evolution. It was seemingly non-existent in 1970 and it has become one of the largest pharmaceutical industries in the world now. Here, the researcher has presented an in-depth analysis of the evolution of pharmaceutical industry in global and India perspective.

1.1 Meaning of Pharmacy, Pharmaceutical, Drugs and Medicines:

The word pharmaceutical comes from the Greek word “Pharmakeia” which means practice and making of medication and vitamins. The modern transliteration of “Pharmakeia” is “Pharmacia” which means pharmacy which involves the making and dispensing of poisons, pharmaceuticals or medicines as well as cosmetics, lotions, perfumes etc.

Pharmaceuticals mean pertaining to the knowledge or art of pharmacy; or to the art of preparing medicines according to the rules or formulas of pharmacy; as, pharmaceutical preparations.

Pharmacy means the art or practice of preparing and preserving drugs, and of compounding and dispensing medicines according to prescriptions of physicians.

Pharmaceutical Drugs are defined as chemical substances used for treating, curing and preventing different types of diseases. Commonly referred to as medicines or medication, pharmaceutical drugs are used in the medical diagnosis, treatment, and prevention or curing disease.

Medicines help in fighting or preventing diseases if they are taken in the right quantity at the right time and as prescribed by the doctor. These medicines either are prescriptive or non-prescriptive.

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Administration of a drug means how the drug is delivered to a patient. Pharmaceutical drugs are available in the forms of pills, tablets, capsules and syrups. They can be taken orally or intravenously (into the blood through a vein). They are administered at regular intervals or all at once depending on doctors’ advice.

1.2 Classification of Drugs:
After the description of the meaning of pharmacy, pharmaceutical and drugs, here the researcher has given the idea about the types of the drugs. The drugs can be broadly classified as Prescription Drugs and Non-prescription Drugs.

1.2.1 Prescription Drugs:
Prescription Drugs are those drugs which are not generally available without the prescription of physician. A prescription drug is a licensed medicine which is available only with the prescription by the physician. Prescription drugs are regulated by the legislation. They are different from the Over the Counter (OTC) medicines which are available at any time without the prescription of the physicians. Generally, the physicians use the term “Rx” as a short form of the prescription drugs. Examples of prescription drugs are as follows.

- Anti-convulsant Drugs
- Anti-obesity Drugs
- Anti-fungal Drugs
- Anti-itch Drugs
- Anti-viral Drugs
- Anti-diabetic Drugs
- Anti-asthmatic Drugs
- Anti-hypertensive Drugs
- Antibiotics
- Anti-migraine Drugs, etc.

1.2.2 Non-prescription Drugs:
Non-prescription Drugs are those that are sold Over the Counter (OTC). It means that they can be available without the prescription of the physician. These drugs are directly sold to the consumers without the prescription of the doctors. There are more than 80 therapeutic categories of non-prescription drugs ranging from weight control drug to anti-acne drugs to analgesics drugs. These drugs are freely available with any chemist, general stores or supermarkets. There are more benefits of these drugs than...
their risks. There are low chances of the misuse of these drugs. Consumers can use such drugs for their self diagnosed health conditions. The examples of non-prescription drugs are as follows.

- Cough-suppressants
- Anti-acne Drugs
- Antiseptics
- Analgesics
- Decongestants
- Aspirin
- Antacids
- Anti-gas agents
- Smoking Cessation Drugs
- Topical Antibiotics, etc.

1.3 **Pharmaceutical Industry- A Global Perspective:**

The emergence of Pharmaceutical Industry shows its roots to the chemical industries of the late nineteenth century in the Upper Rhine Valley of Switzerland. These industries were manufacturing Dye Stuffs\(^2\). They found antiseptic properties in the Dye Stuffs. As a result of this, a number of industries turned into Pharmaceutical Industries. As far as the drug stores are concerned, the History records that the first drugstore to the knowledge of public was opened by Arabian pharmacists in Baghdad in 754\(^3\). After that many more such drugstore soon began to operate throughout the medieval and eventually medieval Europe. By the time of 19th century, many of the drugstores in Europe and North America had eventually developed into larger pharmaceutical companies. Most of the major pharmaceutical companies, that are seen today, were founded in the late 19\(^{th}\) and early 20\(^{th}\) century. The major drugs such as insulin and penicillin were discovered during 1920s and 1930s. These drugs became mass-manufactured and widely distributed. In Switzerland, Germany and Italy, there developed strong pharmaceutical industries during this time. UK, US, Belgium and Netherland were following the path of this development. The governments of these countries enacted legislations to test and approve the drugs and to require appropriate labeling. As the pharmaceutical industry matured, the

\(^2\) [http://www.britannica.com/EBchecked/topic/1357082/pharmaceutical-industry](http://www.britannica.com/EBchecked/topic/1357082/pharmaceutical-industry)

\(^3\) [http://www.britannica.com/EBchecked/topic/1357082/pharmaceutical-industry](http://www.britannica.com/EBchecked/topic/1357082/pharmaceutical-industry)
government passed the legislations to distinguish the Prescription and non-prescription drugs. The pharmaceutical industry got momentum in the early 1950s, due to the development of systematic scientific approaches, understanding human biology and advanced manufacturing techniques. Various new drugs were developed during the 1950s and the mass production and marketing were started during 1960s\(^4\). Drugs such as oral contraceptive pills, Cortisone, blood-pressure drugs and other heart medications were mass manufactured and marketed during this period.

Valium (diazepam), was discovered in 1960. It was marketed from 1963. This drug became the most prescribed drug in the history, prior to controversy over dependency and habituation\(^5\). The governments made attempt to increase regulations and to control financial links between the companies and the prescribing physicians. In U.S., new Food and Drug Administration (FDA) was introduced. The demand for such regulations increased in the 1960s after the thalidomide disaster came to the light. In this tragedy, the use of new anti-emetic in pregnant women caused dangerous birth defects.

In 1964, the World Medical Association issued its Declaration of Helsinki. This Declaration set standards for clinical research. It was made compulsory for the Pharmaceutical companies to prove efficacy in clinical trials before marketing drugs.

Cancer drugs were invented in the 1970s. From 1978, India took over as the primary center of pharmaceutical production without patent protection. The industry remained small scale until 1970s. After that it began to expand at a greater rate. In the 1980s, the drugs for heart diseases and AIDS were invented and they were the main feature of this time period. US FDA started approving such drugs quickly looking to the seriousness of the disease\(^6\).

The governments of the most of the countries passed strong legislations for allowing patent rights. As a result of this, the small scale industries were either closed down or were taken over by the large companies.

In 1990s to till date many mergers and takeovers took place. As a result, the pharmaceutical industry grew large and got the dominant position in the world\(^7\).

\(^5\) www.pharmatech.com
\(^6\) http://levine.sscnet.ucla.edu/papers/imbookfinal09.pdf
\(^7\) http://planningcommission.gov.in/aboutus/committee/wrkgrp12/wg_pharma2902.pdf
1.3.1 Present Scenario of Global Pharmaceutical Industry:
The global pharmaceutical industry experienced shrinkage in the past two years. Now it is on the path of recovery. Decline in the global pharmaceutical industry is due to the global economic recession. On the other hand, the pharmaceutical markets in the developing countries like Asia and Latin America are continuously increasing due to increasing prevalence of diseases, increasing health care spending, and increasing affordability.

IMS Health is global company that provides information, services and technology for healthcare industry. It has provided information that the total value of the global pharmaceutical market is expected to grow by 5-7% in the year 2011. It will be around US $ 880 billion.\(^8\) It was around 4-5% in the year 2010. United States is still the largest market in the world with a market size of around US $ 300 billion and it is expected to grow to around US $370 to $390 billion by 2015.\(^9\)

![The share of Global Pharmaceutical Market 2010](source: www.imshealth.com)

\(^8\) [www.imshealth.com](http://www.imshealth.com)
\(^9\) [www.imshealth.com](http://www.imshealth.com)
As it can be seen in the above given Pie Chart, US is the major player in the world pharmaceutical market. Its share is 33% of the world market. Europe is on the second rank with the share of 30%. Japan’s share in the global market is just 18%. Latin America has 7% and China has 6.5% share of the global pharmaceutical market. Middle East and Australia has 2% and 1.5% respectively. Canada and Africa both have 1% share in the global market.

According to Global Pharmaceutical Market Forecast to 2012, global pharmaceutical industry is projected to grow at a CAGR of around 6.5% during 2011-13.

1.4 Pharmaceutical Industry – Indian Perspective:

India got freedom from Britain in 1947. In the early years immediately after the freedom, the Multinational Companies were allowed to export the drugs. When the Indian government pressurized the companies against imports, these companies developed formulation units in India and exported only bulk drugs to those countries. In 1960s, Indian government encouraged the domestic manufacturers to manufacture bulk drugs. As a result, the domestic companies flourished. But, India has a great heritage of different types of medicinal treatments. The medicinal treatments such as Ayurveda, Unani, etc. medical and pharmaceutical systems were developed by Indian people.

1.4.1 Indian Systems of Medicine:

It is a well known fact that India has a great heritage of various medicinal systems. Indian systems of medicines have always played an important role in meeting the need of global health care. They are playing this important role at present and will do so in the future also. India has six distinct systems of medicine. They are- Ayurveda, Siddha, Unani and Yoga, Naturopathy and Homoeopathy. Though, Homoeopathy came to India in 18th century, it completely assimilated into the Indian culture and got enriched like any other traditional medicine. Apart from these, there are many other healers in the tradition, who have not been recognized under any category. Here is presented brief information about the major Indian Systems of Medicine.

(A) Ayurveda:


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Most of the traditional systems of India including Ayurveda have their roots in folk medicine. However, what distinguishes Ayurveda from other systems is that it has a well-defined conceptual framework that is consistent throughout the ages. In conceptual base, it was perhaps highly evolved and far ahead of its time. It was among the first medical systems to advocate an integrated approach towards matters of health and disease. Another important distinguishing feature of Ayurveda is that unlike other medical systems, which developed their conceptual framework based on the results obtained with the use of drugs and therapy, it first provided philosophical framework that determined the therapeutic practice with good effects. Its philosophical base is partly derived from ‘Samkhya’ and ‘Nyaya vaisheshika’ streams of Indian philosophy.

Ayurveda literally means the Science of life. It is presumed that the fundamental and applied principles of Ayurveda got organized and developed around 1500 BC. Atharvaveda, the last of the four great bodies of knowledge- known as Vedas, which forms the backbone of Indian civilization, contains 114 hymns related to formulations for the treatment of different diseases. From the knowledge gathered and nurtured over centuries, two major schools and eight specializations got evolved. One was the school of physicians called as ‘Dhanvantri Sampradaya’ (Sampradaya means tradition) and the second school of surgeons referred in literature as ‘Atreya Sampradaya’. These schools had their respective representative compilations- Charaka Samhita for the school of Medicine and Sushruta Samhita for the school of Surgery. The former contains several chapters dealing with different aspects of medicine and related subjects. Around six hundred drugs of plant, animal and mineral origin have been mentioned in this treatise.

Sushruta Samhita primarily deals with different aspects of fundamental principles and theory of surgery. More than 100 kinds of surgical instruments including scalpels, scissors, forceps, specula etc. are described along with their use in this document. Dissection and operative procedures are explained making use of vegetables and dead animals. It contains description of about 650 drugs and discusses different aspects related to other surgery related topics such as anatomy, embryology, toxicology and

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therapeutics. Vagabhata's ‘Astanga-Hridaya’ is considered as another major treatise of Ayurveda. The above three documents are popularly known as ‘Brihat trayees’ (the big or major three). In addition to these three scholarly and authoritative treatises, a vast body of literature exists in the form of compilations covering a period of more than 1500 years.

Till the medieval period it was perhaps the only system available in the Indian subcontinent at that time to cater to the healthcare requirement of the people. It enjoyed the unquestioned patronage and support of the people and their rulers. This can be considered as the golden period of Ayurveda because most of the work related to basic concepts, enunciation of different principles, evolution of different formulations occurred during this period. The patronage for the Ayurvedic system of medicine considerably decreased during the medieval period, which was marked by unsettled political conditions in the country and series of invasion by foreigners. The neglect became worse during British rule during which importance was given to Allopathic through official patronage. In the early part of 20th century interest in Ayurveda rekindled as part of national freedom movement. People's representatives even in British India and princely states started asking for suitable measures to develop Ayurveda on scientific lines.

After India gained Independence from the British rule in 1947, the movement for revival of Traditional Systems of Medicine gained momentum. The systems got official recognition and became part of the National Health care network to provide health care to the country's citizen. Government of India initiated a series of measures to improve the position of Ayurveda as one of the major health care systems vital for catering to the primary health care needs of the country. A number of hospitals and colleges for Ayurveda were established.

(B) Siddha:

Siddha system of medicine is practiced in some parts of South India especially in the state of Tamilnadu. It has close affinity to Ayurveda yet it maintains a distinctive identity of its own. This system has come to be closely identified with Tamil civilization. The term ‘Siddha’ has come from ‘Siddhi’ - which means achievement.

13 http://www.indianmedicine.nac.in
14 http://www.indianmedicine.nac.in
15 http://www.indianmedicine.nac.in
Siddhars were the men who achieved supreme knowledge in the field of medicine, yoga or tapa (meditation)\textsuperscript{16}.

It is a well-known fact that before the advent of the Aryans in India a well-developed civilization flourished in South India especially on the banks of rivers Cauvery, Vaigai, Tamiraparani etc. The system of medicine in vogue in this civilization seems to be the precursor of the present day Siddha system of medicine. During the passage of time it interacted with the other streams of medicines complementing and enriching them and in turn getting enriched. The materia medica of Siddha system of medicine depends to large extent on drugs of metal and mineral origin in contrast to Ayurveda of earlier period, which was mainly dependent upon drugs of vegetable origin.

According to the tradition eighteen Siddhars were supposed to have contributed to the development of Siddha medicine, yoga and philosophy. However, literature generated by them is not available in entirety. In accordance with the well-known self-effacing nature of ancient Indian Acharyas (preceptors) authorship of many literary work of great merit remains to be determined. There was also a tradition of ascribing the authorship of one's work to his teacher, patron even to a great scholar of the time. This has made it extremely difficult to clearly identify the real author of many classics.

According to the Siddha concepts matter and energy are the two dominant entities, which have great influence in shaping the nature of the Universe. They are called Siva and Sakthi in Siddha system. Matter cannot exist without energy and vice-versa. Thus both are inseparable. The universe is made up of five proto-elements. The concept of five proto-elements and three doshas in this system of medicine is quite similar to Ayurvedic concept pertaining to them\textsuperscript{17}.

\textbf{(C) Unani:}

Unani medicine has its origin in Greece. It is believed to have been established by the great physician and philosopher- Hippocrates (460–377 BC). Galen (130–201 AD) contributed for its further development. Aristotle (384–322 BC) laid down foundation of Anatomy & physiology. Dioscorides - the renowned physician of the 1\textsuperscript{st} Century

\textsuperscript{16} Narayanaswamy, V., 1975, "Introduction to the Siddha System of Medicine", T. Nagar, Madras (Chennai): Research Institute of Siddha Medicine

\textsuperscript{17} Narayanaswamy, V., 1975, "Introduction to the Siddha System of Medicine", T. Nagar, Madras (Chennai): Research Institute of Siddha Medicine
AD has made significant contribution to the development of pharmacology, especially of drugs of plant origin. The next phase of development took place in Egypt and Persia (the present day Iran). The Egyptians had well evolved pharmacy; they were adept in the preparation of different dosage forms like oils, powder, ointment and alcohol etc.\(^{18}\)

The Arabian scholars and physicians under the patronage of Islamic rulers of many Arabian countries have played great role in the development of this system. Many disciplines like chemistry, pharmaceutical procedures like distillation, sublimation, calcinations and fermentation were developed and refined by them. There are many well-known names- only some names have been mentioned in this article. Jabir bin Hayyan (717–813 AD) a Royal physician of his time has worked on the chemical aspects; Ibne Raban Tabari (810–895 AD) is the author of the book- *Firdous ul Hikmat* and introduced concept of official formulary. Abu Bakar Zarakariya Razi (865–925 AD) has authored a book known as “Alhawi fit tibb”. He has worked in the field of immunology. Of course the name of Bu Ali Sina (Avicenna 980–1037 AD) is always referred in all matters related to Unani. He was a renowned global level scholar and philosopher. He had great role in the development of Unani medicine in the present form. His book *Alqanoon or (The canon of medicine)* was an internationally acclaimed book on medicine, which was taught in European countries till the 17th century. Many physician of Arab descent in Spain have also contributed to the development of the system. Some of the important names are- *Abul Qasim Zohravi (Abulcasus)* 946 – 1036 AD) he is the author of the famous book on surgery “*Al Tasreef*”\(^{19}\).

The Arabs were instrumental in introducing Unani medicine in India around 1350 AD. The first known Hakim (Physician) was Zia Mohd Masood Rasheed Zangi. Some of the renowned physicians who were instrumental in development of the system are- Akbar Mohd Akbar Arzani (around 1721 AD)- the author of the books- *Qarabadin Qadri* and *Tibbe Akbar*; Hakim M. Shareef Khan (1725–1807)- a renowned physician well-known for his book *Ilaj ul Amraz*. Hakim Ajmal Khan (1864–1927) a great name among the 20th Century Unani physicians in India. He was a multifaceted personality besides being a physician he was a scientist, politician and a freedom fighter. He was

\(^{18}\) [http://www.indianmedicine.nac.in](http://www.indianmedicine.nac.in)

\(^{19}\) [http://www.indianmedicine.nac.in](http://www.indianmedicine.nac.in)
instrumental in the establishment of Unani and Ayurvedic College at Karol Bagh, Delhi. He was a keen researcher and has supervised many studies on Rauwolfia serpentina- the source plant for many well-known alkaloids like reserpine, Ajamaloon etc. Another great contributor is Hakim kabeeruddin (1894–1976), he has translated 88 Unani books of Arabic and Persian languages into Urdu. The first institution of Unani medicine was established in 1872 as Oriental College at Lahore in the undivided India. Thereafter many institutions came into existence.

After Independence Unani received boost in the form of Government support through various agencies involved in the development of ISM. At present there are more than 30 colleges offering degree course in Unani medicine and the approximate number of physician turn out is around 20,000. There are around 177 hospitals. A National Institute of Unani Medicine has been established at Bangalore in Karnataka state in 1983 in collaboration with the Govt. of Karnataka- for catering to both academic and R & D requirements. Central Council for Research in Unani Medicine (CCRUM), is the premier agency involved in R & D activities.

According to the basic principles of Unani the body is made up of four basic elements i.e. Earth, Air, Water, Fire which have different Temperaments i.e. Cold, Hot, Wet, Dry. They give raise, through mixing and interaction, to new entities. The body is made up of simple and complex organs. They obtain their nourishment from four humors namely- blood, phlegm, black bile and yellow bile. These humors also have their specific temperament. In the healthy state of the body there is equilibrium among the humors and the body functions in normal manner as per its own temperament and environment. Disease occurs whenever the balance of humors is disturbed.

(D) Homeopathy:

Homeopathy is a system of medicine which involves treating the individual with highly diluted substances, given mainly in tablet form, with the aim of triggering the body’s natural system of healing. Based on their specific symptoms, a homeopath will match the most appropriate medicine to each patient.

Homeopathy is based on the principle that you can treat ‘like with like’, that is, a substance which causes symptoms when taken in large doses, can be used in small

20 http://www.indianmedicine.nac.in
21 Khaleefathullah, S., 2002, “Unani Medicine, Traditional Medicine in Asia”, New Delhi: WHO- Regional Office for South East Asia, PP., 31–46
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amounts to treat those same symptoms. For example, drinking too much coffee can
cause sleeplessness and agitation, so according to this principle, when made into a
homeopathic medicine, it could be used to treat people with these symptoms. This
concept is sometimes used in conventional medicine, for example, the stimulant
Ritalin is used to treat patients with ADHD, or small doses of allergens such as pollen
are sometimes used to de-sensitise allergic patients. However, one major difference
with homeopathic medicines is that substances are used in ultra high dilutions, which
makes them non-toxic.\textsuperscript{22}

The principle of treating “like with like” dates back to Hippocrates (460-377BC) but
in its current form, homeopathy has been widely used worldwide for more than 200
years.

It was discovered by a German doctor, Samuel Hahnemann, who, shocked with the
harsh medical practices of the day (which included blood-letting, purging and the use
of poisons such as arsenic), looked for a way to reduce the damaging side-effects
associated with medical treatment.

He began experimenting on himself and a group of healthy volunteers, giving smaller
and smaller medicinal doses, and found that as well as reducing toxicity, the
medicines actually appeared to be more effective the lower the dose. He also observed
that symptoms caused by toxic ‘medicines’ such as mercury, were similar to those of
the diseases they were being used to treat e.g. syphilis, which lead to the principle he
described as ‘like cures like’.\textsuperscript{23}

Hahnemann went on to document his work, and his texts formed the foundations of
homeopathic medicine as it is practised today. A BBC Radio 4 documentary aired in
December 2010 described Hahnemann as a medical pioneer who worked tirelessly to
improve medical practice, insisting that medicines were tested before use.

\textbf{(E) Yoga:}

Synonymous with absolute health, Yoga in India represents its ancient cultural
heritage. It is the perfect way of life, which maintains the right balance between the

\textsuperscript{22} Endler, P., C., Heckmann, C., Lauppert, E., 1998 “The metamorphosis of
amphibians and information of thyroxine” Fundamental Research in Ultra High
Dilution and Homoeopathy, Dordrecht: Kluwer Academic Publishers

\textsuperscript{23} Montagnier, L., 2009, “Electromagnetic signals are produced by aqueous
nanostructures derived from bacterial DNA sequences”, Interdiscip Sci Comput Life
Sci, 1, PP.,81-90
body, mind and soul. In Sanskrit the term 'Yoga' means 'Union', here union refers to
the union between body, mind and spirit. Yoga in India depicts an ancient scientific
system of physical and mental practices that originated in India thousands of years
back.\(^{24}\)

India Yoga encompasses physical postures, breathing techniques and meditation
aimed at tapping our highest potential, maintaining good health and enjoying a happy
life. Longevity is another benefit connected with Yoga India. It is a science which
affects not only the conscious self but the subconscious, too.

Discovered thousands of years ago, Yoga is derived from the Sanskrit word 'Yuj',
meaning 'to unite'. The union here refers to the union of an individual self with the
divine consciousness. According to the historic records several statues of Lord Shiva
and Goddess Parvati performing various asanaas and meditation were discovered in
archaeological excavations made at Harappa and Mohan-jo-daro. According to Hindu
mythology Lord Shiva established the science of yoga and Goddess Parvati was his
first disciple.

Lord Shiva symbolizes supreme consciousness and the goddess symbolizes supreme
knowledge, will and action. This supreme energy is present in a dormant state in all
living beings and can be tapped through yoga. The goddess revealed this supreme
knowledge of liberation in the form of yoga and tantra to 64 yoginis.

Yoga finds mention in the great Hindu scriptures such as the Gita, the Upanishads and
other Puranas. In the Bhagavad Gita "Yoga is skill in actions", according to Yoga
Sutra "Yoga is the control of the whirls of the mind" and Brahmanda Purana describes
"Yoga is said to be control".\(^{25}\)

The first written account of yoga is found in the Rig Veda. The complete description
of yoga, its principles and goals are found in the Upanishads, which dates back to the
period between 4th and 8th century. Initially the knowledge of yoga was passed on
from mentor to disciple through word of mouth. Initially much effort was not made to
spread the teachings of Yoga and it remained confined to certain people. The Yoga
Institute of Santa Cruz, Mumbai, established in 1918, is the India's oldest technical
institute on Yoga. Now there are numerous Yoga centers spread all over India.

\(^{24}\) [http://www.indiawellness.org/yoga/](http://www.indiawellness.org/yoga/)

(F) Naturopathy:

In India the history of Naturopathy, the ancient science of healing and art of living, can be traced back to the Vedic times. This therapy finds mention in our Vedas and ancient texts. During the ancient times this system of medicine was practiced widely in the country. Our Ayurveda text contains the Swastha Vritta which is nothing but Naturopathy. During the ancient era the physicians used to treat the patient's disease using natural medicines but would also educate them about a healthy lifestyle. Gradually over the time physicians neglected their responsibility of educating people about healthy living and balanced diet and focused only on giving medicines. Just treating the symptoms was not enough and gradually the people realized the importance of Naturopathy, a science of healthy living\(^\text{26}\).

According to Naturopathy, "A disease can be treated by regulating diet without taking any medicine". However if one's diet is not regulated then that person cannot overcome the illness even after taking hundreds of medicines. The best medicine is the right choice of food which is in accord to ones hunger and constitution. The right choice of food alone can help us live a healthy life. The great physicians have always said that the right choice of diet is the best remedy.

The term Naturopathy was coined in 1895 by John Scheel and popularized by Benedict Lust. Dr Benedict Lust is known as the father of modern-day naturopathy as it is he who introduced and spread the knowledge of naturopathy in the US in 1892. Later in the year 1902 he founded the American School of Naturopathy.

Over the years Naturopathy is gaining immense importance in India. Tourists coming to India from far and wide are also enjoying the Naturopathy therapies to rejuvenate themselves and to get rid of illness, if any.

Thus, India is having a rich heritage of medical systems which is very wide and extensive. Several other countries of the world are also getting benefits of this drug and medical system.

\(^{26}\) http://www.indiawellness.org/naturopathy/origin-and-history.html


1.4.2 History of Indian Pharmaceutical Industry:

As we described above, the home-grown systems of medicines were in use in India before British Rule also. The Western System of medicine, popularly known as Allopathic came to use only in the British Rule. Some India people made extraordinary efforts to make the stable development of modern pharmaceutical industry. British Government set up some medical schools for education in modern pharmaceutical research. The Bengal Chemical and Pharmaceutical Works (BCPW) established in 1892 is the example of such development. Besides that there were Indian Drugs and Pharmaceutical Limited (IDPL), Hindustan Antibiotics Limited (HAL), Bengal Immunity Limited (BIL), Bengal Chemicals and Pharmaceutical Limited (BCPL) and Smith Stanistreet Pharmaceutical Limited (SSPL) developed during the British rule. Drug production of around 13% of India’s requirement was being produced by some indigenous firms during and after the time of Second World War. By 1930s, the Indian firms made the efforts to manufacture synthetic bulk drugs also.

Domestic firms dominated Indian Pharmaceutical sector until 1950. Before therapeutic revolution, there was no difference between the domestic and foreign pharmaceutical industry because the foreign pharmaceutical firms were just the manufacturers and not the investors. The therapeutic revolution in India changed the scenario of Indian Pharmaceutical sector. In 1940s and 1950s, the multinational companies came to India and they marketed new medicines, but the domestic companies remained unaffected from this change.

The pharmaceutical industry of India got the new direction with the combined efforts of Council of Scientific and Industrial Research (CSIR) and private manufacturing firms. This effort led to development, application and advancement of substantial skills in the pharmaceutical sector in India. After 1950s, the multinational companies got momentum in the Indian market with the introduction of new drugs. A strong product patent system then prevailing under the British Patents and Designs Act, 1911 (prevailing in India even after independence) led to increasing influence of MNCs in the Indian pharmaceutical markets27. During this time period, the government seemed not to be interested in the development of pharmaceutical sector. A faulty system of

27 Adukiya, R., S., “Overview of Pharmaceutical Industry with Specific Reference to Pharmaceutical Laws of India”, caaa, PP., 1-97
licensing created ease for the multinational companies to enter Indian market even at the menace of indigenous industry. This happened because the MNCs had certain special types of processing of formulations which was not available with the domestic companies. As a result, by 1970s, the share of domestic companies reduced from 62% in 1950 to 32% in 1970. The share of MNCs increased to 68% in 1970 from 38% in 1950.

During this time the government of India established the Indian Drugs and Pharmaceuticals Ltd. (IDPL) with domestic and foreign technological collaboration. This effort of the government provided momentum to the Indian private companies. The development of Council of Scientific and Industrial Research (CSIR) laboratories also contributed to the development of skills for the Indian pharmaceutical sector after 1970s.

After 1950s, there could be seen that the foreign companies started getting dominance in the Indian pharmaceutical market. To avoid the monopoly situation of foreign companies, during late 1960s and 1970s there can be seen conscious efforts for the development of domestic pharmaceutical industry. The government of that time reviewed the legislations and changed the policies that were unfavorable for the Indian pharmaceutical sector and paved the way for the domestic companies.

After a thorough review of the Patents and Deigns Act, 1911, the Ayyangar report examining the legislation came to a conclusion that foreign patent holders dominated the industry through large number of filing and grants. It viewed that the then prevailing patents law failed to work in national interest. Thus came in to being the Patents Act, 1970, which limited patents only to process in case of pharmaceuticals and agricultural chemicals. Further the term of patents was also reduced to 7 years. Apart from this, the Foreign Exchange Regulation Act, 1973 and the National Drug Policy, 1978 provided essential impetus to the growth of the Indian generic industry. Thus, post 1970 reversed foreign dominance of the pharmaceutical industry in India. Large scale bulk drug production was possible and this led to the change in industry landscape.

After a decade, Indian Generic Industry got the path of growth and came to be recognized as an important player in the global generic industry. Substantial price control implemented in 1979 through Drug Price Control Orders, based on National Drug Policy 1978 were the important efforts in the direction of making the equitable
access to the health. This led to the large number of firms to enter into Indian market which contributed for the creation of current scenario of Indian Pharmaceutical Industry. The pharmaceutical industry got the new skills and technological advantage which made remarkable progress of the industry.

After 1990s, the growth in export and increase in domestic consumption led the Indian pharmaceutical firms to the path of growth. In 1998, the domestic companies had the market share of 68% which increased to 77% by 2003. However, after 2005, the Indian Pharmaceutical Industry is fast changing and facing the problem of foreign competition.

1.4.3 Present Scenario of Indian Pharmaceutical Industry:

“The Indian pharmaceutical industry is a success story providing employment for millions and ensuring that essential drugs at affordable prices are available to the vast population of this sub-continent.”

The main aim of the Pharmaceutical Industry is to develop research and distribute drugs in order to provide health care for the people in the society. Pharmaceutical companies are allowed to deal in generic and/or brand medications and medical devices. Just like any other industry, they are also subject to various rules and regulations regarding the patenting, testing and ensuring safety and efficacy and marketing of drugs.

Since the inauguration of the Pharmaceutical Industry in the 19th century, it has covered a long way and now it has become one of the most influential and successful industry in the world with both disagreement and admire on its part.

The Indian Pharmaceutical Industry has grown from a mere US$ 0.3 billion (Rs.237 crores) turnover in 1980 to about US$ 21.73 billion (Rs.104209 crores) in 2009-10. The country now ranks 3rd in terms of volume of production (10% of global share) and 14th largest by value (1.5%). In fact the annual turnover of the Indian Pharmaceutical Industry is estimated to be about Rs. 104944.35 Crores during the year 2010-11. The share of export of Drugs, Pharmaceuticals and Fine Chemicals is more than Rs. 47551.26 crores.

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28 Adukiya, R., S., “Overview of Pharmaceutical Industry with Specific Reference to Pharmaceutical Laws of India”, caaa, PP., 1-97
The domestic Pharmaceutical Industry has recently achieved some historic milestones through a leadership position and global presence as a world class cost effective generic drugs manufacturer of AIDS medicines. Many Indian companies are part of an agreement where major AIDS drugs based on Lamivudine, Stavudine, Zidovudine, Nevirapine are supplied to Mozambique, Rwanda, South Africa and Tanzania which have about 33% of all people living with AIDS in Africa. Many US Schemes are sourcing Anti Retrovirals from Indian companies whose products are already US FDA approved.

According to a report by McKinsey Global Institute, healthcare sector in India grew from 4% of average household income in 1995 to 7% in 2005, and is expected to grow to 13% by 2025. According to the same report, if the Indian economy continues on its current high growth path, then the Indian pharmaceuticals market will undergo major changes in the next decade. It is expected that the market will triple to US$ 20 billion by 2015 and can easily become one of the world's top-10 pharmaceuticals markets. The absolute growth of US$14 billion will be next to the growth potential of the US and China, and the country is in the same league as the growth in Japan, Canada and the UK in terms of scale, the Indian pharmaceutical market is ranked 14th in the world. By 2015, it will rank among the top 10 in the world, overtaking Brazil, Mexico, South Korea and Turkey.

There was another report by RNCOS titled “Booming Pharmaceutical Sector in India” in which it was projected that the pharmaceutical formulations industry is expected to prosper in the same manner as the pharmaceutical industry. The domestic formulations market will grow at an annual rate of around 17% in 2010-11, owing to increasing middle class population and rapid urbanization. Indian Pharmaceutical sector growth has been fuelled by exports and its products are exported to a large number of countries with a sizeable share in the advance regulated markets of US and Western Europe.

Following figures show the revenue in Indian Pharmaceutical Industry, this will be helpful for understanding the current scenario of Indian Pharmaceutical Industry.

\[\text{Rahalkar, H., Op Cit.}\]
Table 1.1  
Table Showing Revenue in Pharmaceutical Industry in India

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (Billion $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$ 10 Bn</td>
</tr>
<tr>
<td>2009</td>
<td>$ 11 Bn</td>
</tr>
<tr>
<td>2010</td>
<td>$ 14 Bn</td>
</tr>
<tr>
<td>2011</td>
<td>$ 16 Bn</td>
</tr>
<tr>
<td>2012</td>
<td>$ 17 Bn</td>
</tr>
<tr>
<td>2013</td>
<td>$ 21 Bn</td>
</tr>
</tbody>
</table>


The total revenue in the pharmaceutical sector comes from the Generic Drugs, OTC Medicines and Patented Drugs. The break-up of the total revenue among all the three types can be seen as follows.

Table 1.2  
Table Showing Break-up of Total Revenue in Pharmaceutical Industry in India

<table>
<thead>
<tr>
<th>Type of Drug</th>
<th>Share in Revenue (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic Drugs</td>
<td>72</td>
</tr>
<tr>
<td>OTC Medicines</td>
<td>19</td>
</tr>
<tr>
<td>Patented Drugs</td>
<td>9</td>
</tr>
</tbody>
</table>


In case of export from the Pharmaceutical Sector in India, the following figures can be seen

Table 1.3  
Table Showing Exports from the Pharmaceutical Industry in India

21
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<table>
<thead>
<tr>
<th>Year</th>
<th>Export (Billion $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>$ 4.2 Bn</td>
</tr>
<tr>
<td>2009</td>
<td>$ 5.1 Bn</td>
</tr>
<tr>
<td>2010</td>
<td>$ 5.2 Bn</td>
</tr>
<tr>
<td>2011</td>
<td>$ 6.7 Bn</td>
</tr>
<tr>
<td>2012</td>
<td>$ 8.5 Bn</td>
</tr>
<tr>
<td>2013</td>
<td>$ 10.1 Bn</td>
</tr>
</tbody>
</table>


### 1.5 Advantages in India for Pharmaceutical Sector:

Indian Pharmaceutical Industry has been particularly the leader in the wide range of complex pharmaceutical manufacturing and technological development. Since it is the highly organized sector, it is receiving the advantage of organized structure. It has currently the revenue earning of around $21 Billion and it is growing at a rate of around 7-8% annually. India has more than 20,000 pharmaceutical manufacturing units scattered across the country. Following are the advantages in India for the pharmaceutical sector.

- **Competent Workforce:**
  
  India has a large pool of human resource having managerial and technical expertise. India has increasing population with higher level of education. The skill of English language and professional competence is easily available for pharmaceutical companies in India.

- **Cost-effective Chemical Synthesis:**
  
  As a result of development, particularly in the area of technology and research and development, the chemical synthesis for various drugs is available at a very cheap rate. With the help of it India can produce and export a wide range of bulk drugs.

- **Legal and Financial Framework:**
  
  India has a 61 year old democracy and as a result a solid legal and financial system. With the advantage of this legal and financial system, any domestic or multinational company can easily set up manufacturing unit in the pharmaceutical sector in India.

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- **Information Technology:**
  India has a well established structure of the colleges and educational institutions imparting education in the field of information technology. The availability of world class system of information technology attracts the foreign companies to India.

- **Globalization:**
  After the economic reforms in 1991, India has boldly adopted the path of globalization. India is ready to welcome MNCs to operate here. A large market of around 70 million of middle class consumers is available for these companies. As a result the pharmaceutical market of India is constantly growing.

- **Increasing Sales:**
  India is gaining the advantage of pharmaceutical manufacturer in the world. Because of low cost production and availability of a wide range of pharmaceutical products, India’s sale is booming in the pharmaceutical market. The sale in pharmaceutical market of India is growing at a rate of around 9% per annum.

- **Medical Tourism:**
  Medical tourism is an age old concept. The people of one country go to the other country for seeking the medical remedy of the diseases. People of developed counties come to India seeking the natural and holistic remedy and eco-friendly experience. Thus, it is the advantage for the pharmaceutical companies of the world to operate in India. Therefore, the foreign companies are attracted to operate in India.

1.6 **Profile of the Sample Companies:**

To conduct the research on the pharmaceutical companies in India, it is necessary for the researcher to select an appropriate sample out of the universe. The selected sample should be of adequate size and should be representative of universe. Here the researcher has selected 10 pharmaceutical companies to undertake the research on pharmaceutical sector.

The list and profile of the selected pharmaceutical companies is given as under.

1. Aurobindo Pharma
2. Cadila Pharma
3. Cipla Limited
4. Dr. Reddy’s Laboratories
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(5) Ipca Laboratories
(6) Jubilant Life Science
(7) Lupin Limited
(8) Sun Pharmaceutical
(9) Torrent Pharmaceuticals
(10) Glenmark Pharmaceuticals

(1) Aurobindo Pharma:
Aurobindo Pharma was founded in 1986 by Mr. P. V. Ramprasad Reddy, Mr. K. Nityananda and a small group of highly committed professionals. The company commenced its operations in 1988-89 as a single unit manufacturing Semi-Synthetic Penicillin (SSP) at Pondicherry. Aurobindo Pharma became a public company in 1992 and listed its shares in the Indian stock exchanges in 1995. Besides Semi-Synthetic Penicillin, it has a presence in key therapeutic segments such as neurosciences, cardiovascular, anti-retrovirals, anti-diabetics, gastroenterology and cephalosporins, among others. With the cost effective manufacturing technology and a few loyal customers, the company entered high margin specialty generic formulation segment. Today, the company has evolved as an active manufacturing company of pharmaceutical ingredients and formulations products. The company is R & D focused company and it has multi-product portfolio with manufacturing facilities in several countries.

Aurobindo is targeting to earn US $ 2 billion by the year 2015-16 with the help of its formulation business which is systematically organized and internationally focused. It is leveraging its API and formulations business with the wide basket and customers’ confidence. Aurobindo's nine units for APIs / intermediates and seven units for formulations are designed to meet the requirements of both advanced as well as emerging market opportunities.

Aurobindo gains reputation of having a position among top 10 companies in terms of consolidated revenue. Aurobindo exports to over 125 countries across the globe with more than 70% of its revenues derived out of international operations. Aurobindo makes use of in-house R&D for rapid filing of patents, Drug Master Files (DMFs), Abbreviated New Drug Applications (ANDAs) and formulation dossiers across the
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world. Aurobindo Pharma is among the largest filers of DMFs and ANDAs from India.
Catering to over 100 countries, Aurobindo Pharma has identified international operations as a major engine of growth and has since been expanding its global network of marketing and manufacturing operations. It concentrates its focus on such major countries as China, Brazil, Japan, Netherlands, South Africa, Thailand, UK, USA, Russia and many more. With its subsidiary modal, brilliant and hard working workforce, very good track record, best infrastructure and cost efficiency, Aurobindo is ready to face the challenges of pharmaceutical market.

(2) Cadila Pharma:
Cadila Pharmaceuticals Ltd. is one of the largest privately held pharmaceutical companies in India. It’s headquarter is at Ahmedabad in Gujarat State. Over the last six decades the company has been manufacturing pharmaceutical products in India and selling and distributing to over eighty five countries of the world. Cadila is strongly focused on innovation and research. It is present in forty five therapeutic areas spread across twelve specialties. Cadila is strongly focused on research and development in all the areas such as Biotechnology, APIs, Formulations, Plant Tissue Culture or Phytochemistry. At Cadila, there are working 300 scientists in various research and development to satisfy the high unmet needs of the medical field. The company’s formulations manufacturing plant at Dholka near Ahmedabad, Gujarat is spread over hundred acres of land. This state-of-the-art facility is not only impressive in size, but is also USFDA approved.
Another formulations manufacturing facility is located at Samba in Jammu and Kashmir. The facility meets most of the stringent quality standards across the globe to produce tablets, capsules, soft and hard gelatin capsules, liquids and orals.
Two Active Pharmaceutical Ingredient (API) manufacturing units at Ankleshwar, Gujarat manufacture a wide range of APIs and intermediates including many USFDA-certified products.
The company has strong foothold in the African continent through its formulation manufacturing facility at Addis Ababa in Ethiopia.
The success story of Cadila started in 1951 when Indravadan Modi thought of pharmaceutical unit. On March 13th, 1952, Cadila started production. In 1967, Cadila shifted to its own factory premises with operations full-fledged spanning Production,
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These are just the highlights of the growth and development of Cadila Pharmaceutical Ltd. There is a long success story of the company which is not included here because of the limitation of the space.

(3) Cipla Limited:

Cipla was incorporated in 1935. Its goal is to ensure that no patient should be denied of high quality and affordable medicine and support. Cipla’s mission is to be a leading global healthcare company which uses technology and innovation to meet everyday needs of all patients. The journey of Cipla started when its founder chairman Dr. K. A. Hameid set up an enterprise with a vision to make India self sufficient in health care sector. Over the past 77 years, Cipla has emerged as one of the world’s most respected pharmaceutical company. Cipla has 34 state-of-the-art manufacturing facilities that make Active Pharmaceutical Ingredients (APIs) and formulations. Cipla has over 2000 products in 65 therapeutic categories with over 40 dosage forms, covering wide range of diseases. Cipla’s Research and Development Center is focused on developing innovative products and drug delivery system being pioneer in the world in several pharmaceutical categories. Today, Cipla is one of the world’s largest
generic pharmaceutical companies with a strong presence in 170 countries of the world. Cipla maintains world class quality in all its products and services.

In 1939, Mahatma Gandhi visited Cipla and inspired the founder to make essential medicines for the country. During the Second World War, when India was dependent on the imported medicines, Cipla manufactured such drugs. In 1960, Cipla pioneered API manufacturing in the country and laid the foundation for the bulk drugs industry in India. In 1996, Cipla gave the world the first transparent dry powder inhaler which was so simple and easy to use, it changed the face of inhalation therapy in India.

During the 2005 Bird Flu epidemic, Cipla produced an anti-flu drug within a period of 2-3 months, which would have normally taken at least 3 years to develop. In 2012, Cipla made a breakthrough in reducing the prices of cancer drugs, thus making world-class medicines affordable and accessible to cancer patients.

Thus, Cipla is dedicated to contribute to the health of India as well as of the world by supplying world class medicines at the affordable rates.

(4) Dr. Reddy’s Laboratory:

Founder Chairman Dr. K Anji Reddy established Dr. Reddy's Laboratories with an initial capital outlay of Rs.25 lacs. The certificate of incorporation was issued on 24th February 1984 and on the same day the first meeting of the board of directors of Dr. Reddy’s Laboratories private limited was held at its registered office.

Mr. M. P. Chari, who is the General Manager of Production at Standard Organics Limited, became the first Managing Director of Dr. Reddy’s laboratories. The same year, Dr. Anji Reddy and Murali K. Divi (Currently Chairman of Divis Laboratories) took over Cheminor Drugs and Murali Divi became the Managing Director of the company. On 1st May, 1984, the construction of the first API manufacturing facility at Bollaram, Hyderabad, was started. The plant became operational in June 1985.

In 1986, Dr. Reddy’s Laboratory went public with listing on Bombay Stock Exchange. Dr. Reddy’s Laboratory offered 7,50,000 equity shares of Rs. 10 each for cash at par linked with 1, 50,000 of 15% secured, redeemable, non-convertible debentures of Rs. 100 each for cash at par. The issue opened for NRIs on 24th May, 1986 and for Indian Public on 5th June, 1986.

Dr. Reddy’s Laboratories Private Limited commenced the commercial production of its first API, Methyldopa, a hypertension drug which was not available in India, in
1985. It is supplied to Merck, Sharp, Dhome (MSD), manufacturers of Aldomet and exported to West Germany, Yugoslavia, Bangladesh, Kenya and Canada. Formulation Operations began with formation of Stangen Pharmaceuticals. K. B. Sankar Rao took over as the production manager and T. R. Bhoopathy as the head of marketing of the company. Stangen Pharmaceuticals started expanding its marketing network to Eastern, North Eastern, Northern and Central India. Dr. Reddy’s became the first Indian pharmaceutical company to export Norfloxacin and Ciprofloxacin to Europe and Far East. Dr. Reddy’s and Cheminor Drugs jointly established the Dr. Reddy’s Research Foundation (DRF). Dr. Reddy’s became the first company to start work on drug discovery programs in the country. DRF is recognized as a scientific and industrial research organization by the Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India. As a part of the company’s plans to expand its generic business and enter highly regulated markets like the US, Dr. Reddy’s started construction of a finished dosages facility at Bachupally, Hyderabad. The construction of the plant was completed in 1996. Dr. Reddy’s acquired American Remedies Limited (ARL) and the combined entity occupies 5th Rank in India as per ORG. The acquisition helped Dr. Reddy’s focus on improving the efficacy of co-prescribed drugs. Dr. Reddy's became India's third largest pharmaceutical company with the merger of Cheminor Drugs Limed (CDL) a group company, on December 11, 2000. Thus, Dr. Reddy’s Laboratory is on the path of growth and it is acquiring a proud position in the pharmaceutical industry of India. 

(5) IPCA Laboratory:

IPCA is fully-integrated Indian Pharmaceutical Company. The company manufactures over a 350 formulations and 80 APIs for various therapeutic segments. For over more than 60 years, IPCA is partnering healthcare in over 110 countries. IPCA holds market in countries like Africa, Asia, Australia, Europe and the US. IPCA is one of the world’s largest manufacturers and suppliers over a dozen of APIs. IPCA is a therapy leader in India for anti-malarials with a market share of over 34% with a fast expanding presence in the international market. IPCA also leads in DMARDs (Disease Modifying Anti-Rheumatic Drugs) treatment for rheumatoid arthritis. IPCA has leading brands in 5 therapeutic areas. IPCA has international clients such as
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AstraZeneca, GlaxoSmithKline, Merck, Roche, and Sanofi Aventis. Quality assurance is the goal of IPCA. IPCA works with the focus on sustainable betterment. In 1981, IPCA started R&D-API and R&D-Formulations development departments to provide technology based products. In 1984, first API plant of IPCA was commissioned at Ratlam. In the same year, the second formulations plan of IPCA was started at Ratlam. In 1993, IPCA acquired Hoechst India’s formulation unit at Kandla. In 1995, IPCA commissioned modern formulations plant at Athal, Silvassa. In 2001, IPCA acquired ‘National Druggists (Pty) Ltd’ in South Africa. In the same year, ‘IPCA Pharma Nigeria Ltd’ was incorporated in Nigeria. In August 2005, Innotech Pharma merged with IPCA.

These are a few achievements of IPCA. There are a lot more achievements of the company but all of them are not discussed here because of the limitation of space.

(6) Jubilant Life Sciences Limited:


At present, Jubilant Life Sciences Limited is an integrated global pharmaceutical and life sciences company. The company is engaged in manufacturing and supplying of APIs, Solid Dosage Formulations, etc. Over the years, Jubilant has extended its
footprints beyond India in USA, Canada, Europe and other countries in the world. Jubilant has 7 world class manufacturing facilities in India and 3 in North America and a team of over 6300 people across the globe. Jubilant Life Science Limited progresses in diverse business with the help of R&D facilities, Command over cheap technologies and economies to scale. Jubilant Life Sciences is committed to leverage innovation and scale of operations at every step of the pharmaceutical value chain to deliver superior value to the customers.

(7) Lupin Pharmaceuticals Inc.: 
Lupin Pharmaceuticals Inc. is the U. S. wholly owned subsidiary of Lupin Limited. It is among the top five pharmaceutical companies in India. The company was named after the Lupin flower because of the inherent qualities of flower. Lupin flower has also the quality for nourishing the land. The flower is also known to be tolerant of infertility of soil and capable of pioneering the change in barren land. The Lupin flower and its bean pods are used as food and source of nourishment. Thus it is useful for protecting and nourishing the life. For the last forty four years, Lupin is standing strong with the entrepreneurial spirit, culture of creativity, and innovation and pride in belonging to an industry that makes a difference in the life of people. Lupin is today a fully integrated pharmaceutical company with an unequaled position in the US, India and Japan. Lupin has cutting edge research, world class manufacturing facilities and a global supply chain. In India, Lupin Limited is headquartered in Mumbai. It is strongly research focused company. It has a program of developing new Chemical Entities. It has a state-of-the-art R&D center at Pune and it is a leading global player in Anti-TB, Cephalosporins (anti-infective) and cardiovascular drugs. The company has a notable presence in the areas of diabetes, anti-inflammatory and respiratory therapy. Lupin creates strength through vertical integration in discovery research, process chemistry, active pharmaceutical ingredient production, formulations development and regulatory filings. Thus, Lupin Pharmaceutical Inc. is one of the major pharmaceutical companies in India.

(8) Sun Pharma:
Sun Pharma was established in 1983 with five psychiatry products and a two person marketing team. It manufacturing capacity for tablets and capsules was established at
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Vapi, Gujarat. Till 1987, the sales of the company rolled out nationwide. In 1988, the company introduced the first cardiology products were launched. In 1989, the company started exporting its products to the neighboring countries. In the same year the company introduced the products for gastroenterology. In the year 1991, Sun Pharma established its first research center. It created a strong base for the products in the coming years. In the year 1994, Sun Pharma went public and its issue was oversubscribed by 55 times. In 1995, Sun Pharma established its first API manufacturing plant in Panoli, Gujarat. In 1996, an API plant at Ahmednagar was acquired from Knoll Pharma. The sales of the company spread over 24 countries. In 1997, the company purchased equity stake in TDPL and MJ Pharma. The company started new research facilities at Mumbai. In 1998, the company opened a new formulations plant at Silvassa. In the year 1999, the company acquired Milmet Labs and Gujarat Lyka Organics. In 2000, the company acquired Pradeep Drug Company. In 2001, the company set up a new formulations plant at Dadra. In 2004, the company established a new formulations plant in Dhaka. In 2007, it was decided to demerge the research company into a separate company Sun Pharma Advanced Research Company. In 2008, the company acquired Chattem Chemicals Inc. In 2010, Sun Pharma acquired a controlling stake in Israel based Taro Pharmaceuticals. As a result the companies US business doubled. In the year 2012, the company acquired Dusa Pharmaceuticals and generic business of URL Pharmaceuticals.

Thus, Sun Pharma is growing its business in India and several other countries.

**9 Torrent Pharmaceuticals Limited:**

Torrent Pharma is a flagship company of Torrent Group. It is ranked among top five companies of India. It is a dominant player in the therapeutic area of Cardiovascular, Central Nervous System. It has achieved a significant position in gastro-intestinal, diabetology, anti-infective and pain management segments. Recently the company has entered in the oncology therapeutic segment, gynecology and pediatric segments. Torrent pharma has the competitive advantage from its world class manufacturing facilities, advanced R & D capabilities, extensive domestic network and wide spread global presence. The company has three world-class manufacturing facilities at Indrad (Gujarat), Baddi (Himachal Pradesh) and Sikkim. The company is establishing a new manufacturing facility at Dahej SEZ in western India. It will cater to the international market. Torrent Pharma is the sole
manufacturer of insulin formulations for Novo Nordisk in India since early 90s. The company has set up a dedicated manufacturing and packaging facility for insulin. Recently, Torrent Pharma entered into a definitive binding agreement with Elder Pharma to acquire its branded domestic formulations business in India and Nepal. This will be the largest acquisition by an Indian pharma company in the domestic market and will significantly strengthen its position in the neutraceuticals and women healthcare segments.

Torrent Pharma has a strong international presence straddling over 70 countries across five continents with over 1200 product registrations. It has wholly owned subsidiaries in USA, UK, Germany, Brazil, Russia, Mexico, Philippines Australia and other major markets. These wholly owned subsidiaries spearheads the company’s entry into several new regulated and semi regulated international markets.

The origin of the company dates back to 1959 when Shri U. N. Mehta started pharma operations. In 1971, Trinity Laboratories renamed as Torrent Pharmaceuticals Limited. In 1980, the company started first manufacturing facility at Vatva in Ahmedabad.

Today, Torrent Pharma, with its state of the art manufacturing and research facilities and a global presence, is all on the edge to carve a niche for itself in the international pharma field. It is well set on an exciting growth phase in all directions.

(10) **Glenmark Pharmaceuticals Limited:**

Glenmark Pharmaceuticals Limited was incorporated in India under companies act under the name Glenmark Pharmaceuticals Limited. In 1979, the company entered into dermatology field with the launch of ‘Candid Cream’. In 1980, the company started export business. The company set up its first manufacturing facility at Nasik, Maharashtra, India. The company started R & D department at the Nasik plant in 1984. In 1989, the company started its operations in Afghanistan, Srilanka, Kenya and Mauritius. Nasik plant was expanded by acquiring adjacent plot to include the R & D facilities. In 1996, the company incorporated Glenmark Exports Private Limited, a wholly owned subsidiary to expand its position in international market. In 1999, the company started marketing products in Brazil. In 2000, the firm brought an IPO. The issue was oversubscribed by 65 times. In 2001, the company introduced API manufacturing business. In 2002, the company acquired manufacturing facility at Ankleshwar, Gujarat from GlaxoSmithKline Pharmaceuticals Limited. In 2004, the
company commissioned its own manufacturing facility at Goa to service export to regulated market viz. USA. In 2005, the company commissioned a new manufacturing facility at Baddi, Himachal Pradesh.

Today, Glenmark Pharmaceuticals Ltd. is a research-driven, global, integrated pharmaceutical company. Glenmark is a leading player in the discovery of new molecules, both NCEs (new chemical entity) and NBEs (new biological entity), with seven molecules in various stages of clinical development & pre-clinical development. The Company has a significant presence in branded generics markets across emerging economies including India. Its subsidiary, Glenmark Generics Limited has a fast growing and robust US generics business. The subsidiary also markets APIs to regulated and semi-regulated countries. Glenmark employs over 10,400 people in over 80 countries. It has 14 manufacturing facilities in four countries and has 6 R&D centers.