

# TOXICOLOGIST

## HISTORY

**1900 A.D.**  
Toxicology was established as a scientific discipline in the late 19th century. The scientific method was applied to the study of poisons, and the field was formalized as a distinct branch of science.

**1800 A.D.**  
The scientific method was applied to the study of poisons, and the field was formalized as a distinct branch of science.

**1700 A.D.**  
The scientific method was applied to the study of poisons, and the field was formalized as a distinct branch of science.

**1600 A.D.**  
The scientific method was applied to the study of poisons, and the field was formalized as a distinct branch of science.

## JOB RESPONSIBILITIES

- Cooperate with other scientific staff members regarding findings and share research.
- Complete reports of research findings.
- Observe tests, materials and reactions in short term and long term effects.
- Identify new acids or organic toxic substances.
- Be able to conduct field experiments and experiments within a laboratory setting.
- Analyze data statistically.
- Create safety profiles.
- Advise on safety protocols for chemical findings.
- Complete risk analysis and carry out detailed plans of action.

## Benefits and Challenges

**Benefits**

- Toxicologists make products safe for the general public, which is personally rewarding.
- Toxicologists are well-paid.
- Toxicologists are in high demand, which creates strong job security.
- Medical emergency and post-mortem are typically involved with toxicology.

Toxicologists often stay in a lab for long periods of time. There is a lot of getting hurt by the toxic substances they handle. Completion of the education requirements is a VERY lengthy process, and often results in large amounts of student loan debt.

**CHALLENGES**

## Types of TOXICOLOGISTS

- **Forensic Toxicologist**  
Identify and analyze poisons in a body by producing scientific tests on body fluids and tissue samples, generally for the purpose of the law.
- **Analytical Toxicologist**  
Measure, identify, and identify unknown compounds in specimens and in testing.
- **Industrial Toxicologist**  
Investigate a wide variety of toxic and offensive products of medicines, pesticides, food, and water.
- **Environmental Toxicologist**  
Study toxic substances and their effects on the environment and on the organisms that live in it.
- **Medical Toxicologist**  
Treat for poisons, which have been involved with drugs and substances causing possible unhealthy effects.

## Fun Facts

- The most common type of toxicologist is the **Forensic Toxicologist**, which is toxicology for the purpose of law.
- Did you know that Toxicologists play a key role in the public's and environment's health?
- Toxicologists can sometimes spend an entire week in a lab!
- Can you believe that researchers, professors, and students all have facilities that could be fatal in large amounts?
- Did you know that Cleopatra the Egyptian queen experimented with toxins at work, and committed suicide by the means of an asp?
- In the year 2009, 617 Toxicology labs received 4.1 million requests, to establish forensic services.

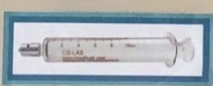
## Key Tools of the Trade

A compound microscope uses multiple lenses to enlarge the image of a sample that can not be seen by the naked eye.



**Lab Syringe**  
Lab Syringes are used for injecting into the body and withdrawing chemicals, gases, and other liquids out of the body.

**Medical Syringe**  
Medical Syringes are used for the collection of blood for chemical analysis and the administration of medicines.



Beakers contain and measure liquids that are used for Toxicology. Most beakers are, forged with borosilicate glass, which helps the beakers resist chemical interaction and thermal shock.



**Safety Glasses**  
They often protect the Toxicologist's eyes from infections or dangerous chemicals being tested.

These specific gloves can withstand temperatures that are high and they are resistant to most chemicals that Toxicologists use.

**Disposable Nitrile Gloves**



## EDUCATION

- Have a high school diploma.
- Have a Bachelor's degree in Biology.
- Master's degree in Toxicology (optional).
- Doctor of Pharmacy degree (optional).
- Doctor of Philosophy degree (optional).
- Postdoctoral training (optional).

## ENTRY SALARY

	Locally (San Diego)	Nationally (U.S.A.)	Globally (all countries)
Hourly	\$41	\$36	\$30
Monthly	\$7,062	\$6,744	\$5,694
Annually	\$84,746	\$74,931	\$20,328

As a Toxicologist, the average entry salary in Southern California is about \$80,000 per year. As years of experience increase, it is very possible for salary to increase.

## COST

- Cost**
- Bachelor's degree  
Average: \$10,000  
Public: \$2,000 - \$5,000  
Private: \$5,000 - \$10,000
  - Master's degree  
Public/private tuition: \$41,000  
High-end private tuition: \$70,000
  - Doctor of Pharmacy degree  
\$65,000 - \$100,000
  - Doctorate Degree  
Public institution: \$11,100  
Private institution: \$44,000  
Online programs: \$5,000
  - Postdoctoral Training  
\$47,000

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## HISTORY

**400 B.C.E.**  
Toxicology was studied very early in history. Individuals studied the toxicity of venom released in snake bites. The Greeks and Romans also discovered a strong knowledge of many naturally occurring poisons, which is essentially the foundation of toxicology.

**16th Century**  
During the 16th Century, Paracelsus studied toxicology concepts that began to take shape for toxicologists to study. Paracelsus studied a major topic in toxicology which was the dose-response relationship. Paracelsus was also known as one of the original founders of toxicology.

**19th and 20th centuries**  
In the 19th and 20th centuries, toxicologists have taken an approach to identifying and describing chemicals and products with properties that decrease the number of negative impacts on human and on the environment. Modern toxicology has tried to move away from the usual approach of animal testing and towards a harmless procedure of experimentation.

**19th Century**  
In the 19th century, a person named Matthew Joseph Berenbrunth Orfila discovered a structured connection between the chemical and biological properties of poisons. Although toxicology was around for quite some time in terms of study and practice, Orfila is considered the first official toxicologist.

## JOB RESPONSIBILITIES

- Cooperate with other scientists/staff members regarding findings, and share research.
- Compose reports of research findings.
- Observe toxic materials and radiation's short term and long term effects.
- Identify man-made or natural toxic substances.
- Be able to conduct field experiments and experiments within a laboratory setting.
- Analyze data statistically.
- Create safety profiles.
- Advise on safety protocols for chemical findings.
- Complete risk analysis and carry out devised plans of action.

## Benefits and CHALLENGES

### Benefits

- Toxicologists make products safe for the general public, which is personally rewarding.
- Toxicologists are well-paid.
- Toxicologists are in high demand, which creates strong job security.
- Medical coverage and paid vacation are typically included with employment.
- Toxicologists often stay in a lab for long periods of time.
- There is risk of getting hurt by the toxic substances they handle.
- Completion of the education requirements is a VERY lengthy process, and often results in large amounts of student loan debt.

### CHALLENGES



## Types of TOXICOLOGISTS

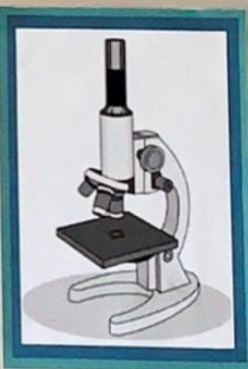
- **Forensic Toxicologist**  
Identify and drugs or chemicals in a body by performing scientific tests on body fluids and tissue samples, generally for the purpose of law.
- **Analytical Toxicologist**  
Measures, detects, and identifies unknown compounds in specimens and in biology.
- **Industrial Toxicologist**  
Develops a large variety of safe and effective products of medicines, pesticides, food, and water.
- **Environmental Toxicologist**  
Studies toxic chemicals not only in organisms but in their natural environments and the ecosystem in which they belong.
- **Medical Toxicologist**  
Care for patients who have been involved with drugs and substances causing possible unhealthy effects.

## Key Tools

A compound microscope uses multiple lenses to enlarge the image of a sample that can not be seen by the naked eye.



**Lab Syringe**  
Lab Syringes are used to draw the body and w/ gases, and other  
**Medical Syringe**  
collection of blood and the administration of  
**Medi**



### Safety Glasses

They often protect the Toxicologist's eyes from infections or dangerous chemicals being tested.

These specific gloves can withstand temperatures that are high and they are resistant to most chemicals that Toxicologists use.

### Disposable Nitrile Gloves



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## Fun Facts

• The most common type of Toxicologist is the Forensic Toxicologist, which is Toxicology for the purpose of law.

• Did you know that Toxicologists play a key role in the public's and environment's health?

• Toxicologists can sometimes spend an entire week in a lab!

• Can you believe that mushrooms, potatoes, and almonds all have toxins that could be fatal in large amounts?

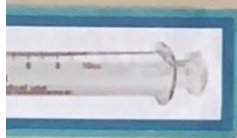
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• Did you know that Cleopatra the Egyptian queen experimented with toxins as well, and committed suicide by the venom of an asp?

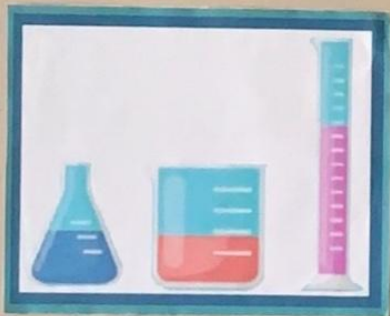
## Tools of the Trade

**Syringe**  
Syringes are used for injecting into and withdrawing chemicals, and other liquids out of the body. They are used for the analysis of blood for chemical analysis and administration of medicines.

**Medical Syringe**



Beakers contain and measure liquids that are used for Toxicology. Most beakers are forged with borosilicate glass, which helps the beakers resist chemical interaction and thermal shock.



# I S T

## EDUCATION

- Earn a high school diploma.
- Earn a Bachelor of Science degree.  
A Bachelor of Science degree is typically earned in four years and opportunities exist in fields such as toxicology, biology, or chemistry.
- Earn a Master's degree.  
Some toxicologists also obtain Master of Science Degrees in Pharmacology, Toxicology, or another field.
- Earn a Doctor of Pharmacy (PharmD) degree.  
Pharmacologists may work with clinical research teams to create control systems, test a PharmD is required. A PharmD degree is a professional degree and is typically a four-year, full-time program.
- Acquire a Doctorate Degree.  
Once you've obtained a PharmD or a Master of Science degree, you may spend four years studying pharmaceutical research, environmental toxicology, or forensic toxicology.
- Complete Postdoctoral training.  
Continue your education by being supervised by academic instructors in conducting independent research, writing papers, and writing scientific reports in a laboratory.



## ENTRY SALARY

	Locally (Los Angeles)	Nationally (U.S.A)	Globally (All countries)
Hourly	\$41	\$36	\$10
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As a Toxicologist, the average entry salary in Southern California is about \$80,000 per year. As years of experience increase, it is very possible for salary to increase.

## COST

### Cost

**Bachelor's degree**  
Average College, \$2,527  
Public Four-year colleges, \$25,585  
Private Four-year Colleges \$62,644

**Master's degree**  
Public/private schools \$40,000  
High-end graduate school, \$100,000

**Doctor of Pharmacy degree**  
\$65,000 - \$200,000

**Doctorate Degree**  
Public institution, \$11,120  
Private university, \$44,020  
Online programs, \$6,000

**Postdoctoral Training**  
\$47,000

Event Name - Health Career Display

Competitors - Rich Juson and Margaret Yonzon

HOSA Division - Middle School Division

HOSA Chapter Number - 32050

School Name - Caroldale Learning Community STEAM Academy

State/Association - California

Profession - Toxicologist

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