# Top Careers in Chemistry

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>JOB SUMMARY</th>
<th>ENTRY-LEVEL EDUCATION</th>
<th>MEDIAN PAY 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal government</td>
<td>Work on regulatory compliance, etc.</td>
<td>BS - PhD</td>
<td>$117,850</td>
</tr>
<tr>
<td>Research and development</td>
<td>Common to work in diverse setting on complex problems</td>
<td>PhD or MS</td>
<td>$101,180</td>
</tr>
<tr>
<td>Chemical manufacturing</td>
<td>Investigate possible new products and ways to improve existing ones</td>
<td>BS</td>
<td>$77,740</td>
</tr>
<tr>
<td>Testing laboratories</td>
<td>May work on environmental protection or other problems requiring accurate tests</td>
<td>BS</td>
<td>$61,190</td>
</tr>
<tr>
<td>Waste management and remediation services</td>
<td>May design chemical processes and products that are environmentally sustainable</td>
<td>BS</td>
<td>$54,160</td>
</tr>
</tbody>
</table>

### Employment outlook

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Employment - 2021</th>
<th>Projected Employment - 2031</th>
<th>Change, 2021-31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemists and materials scientists</td>
<td>90,600</td>
<td>96,300</td>
<td>+6 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5,700</td>
</tr>
<tr>
<td>Materials scientists</td>
<td>7,000</td>
<td>7,400</td>
<td>+6 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>400</td>
</tr>
<tr>
<td>Chemists</td>
<td>83,600</td>
<td>88,900</td>
<td>+6 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5,300</td>
</tr>
</tbody>
</table>
Largest employers in Chemistry

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>% OF TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical manufacturing</td>
<td>33%</td>
</tr>
<tr>
<td>Research and development in the physical, engineering, and life sciences</td>
<td>17%</td>
</tr>
<tr>
<td>Testing laboratories</td>
<td>9%</td>
</tr>
<tr>
<td>Federal government, excluding postal service</td>
<td>7%</td>
</tr>
<tr>
<td>Administrative and support and waste management and remediation services</td>
<td>4%</td>
</tr>
</tbody>
</table>

Examples jobs for chemists

- **Analytical chemists** determine the structure, composition, and nature of substances.
- **Forensic chemists** analyze evidence for clues to help solve crimes.
- **Inorganic chemists** study the structure, properties, and reactions of molecules that do not contain carbon, such as metals.
- **Medicinal chemists** research and develop chemical compounds that can be used as pharmaceutical drugs.
- **Organic chemists** study the structure, properties, and reactions of molecules that contain carbon.
- **Physical chemists** study the fundamental characteristics of how matter behaves on a molecular and atomic level and how chemical reactions occur.
- **Theoretical chemists** investigate theoretical methods that can predict the outcomes of chemical experiments.
Earning degrees in the field

- BS in chemistry
  - Typically, 4 years of study
- MS in chemistry
  - Typically, 2 years of study past the BS
- PhD in chemistry
  - Typically, 3 years of study past the MS

UTD offers
Financial aid and other help
Many times
- one can be paid to earn these degrees
Bioinorganic chemistry of transition metals homeostasis: transmembrane metal transporters and associated metalloproteins

The Meloni lab focus on understanding selectivity, promiscuity, kinetics, energetics and transport mechanism in metalloproteins important for metal metabolism in health and disease.

A multidisciplinary team of talented students:

- Molecular biology
- Recombinant protein expression, purification and analysis
- Enzymology and enzyme kinetics
- Membrane protein reconstitution
- Spectroscopy and structural biology
- Analytical techniques

Dr. Gabriele Meloni
Email: gabriele.meloni@utdallas.edu
Website: www.melonilab.org
Polymers for Sustainable 3D Printing – Smaldone Lab – NS&M Chem

The Problem With Plastics
- petroleum feedstocks
- single use / low recycling

3D Printing as a Solution
- on demand production
- reduced waste
- recyclable
- improved lifespan / repairable

Chemistry to Make and Break Bonds
- reversible and controllable chemical bonds
Dean Sherry Lab: Probing disease using advanced MRI/NMR Technology and novel MRI contrast agents

Hyperpolarized Carbon 13 Agents
Boosting MRI signal more than 10,000 times to watch how nutrients are processed in the body in real time

Designing “Smart” Redox Sensors
Hyperpolarized N15 biomimetic molecules that change during disease and tissue damaged

Chemical Exchange Saturation Transfer (CEST) Imaging
Designing 3D molecules to capture and exchange with water to look at changes in tissue structure and probe the speed of water movement across biological membranes

Undergraduate Emily Buchanan presenting this project at ISMRM Meeting in London (2022)
Questions?