A minor is offered in biochemistry. Declaration of a biochemistry minor is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements
A minimum of 21 credits is required for the minor, at least 9 of which must be upper-division. The College of Arts & Sciences will allow a maximum of 9 hours of transfer credit, including 6 upper-division credit hours to count toward a minor. Students may transfer courses through organic chemistry only. All courses required for the minor must be completed with a grade of C- or better, and the overall GPA in all BCHM and CHEM courses taken must be a 2.00.

Students who have taken CHEN 1211/CHEM 1221 may substitute them for CHEM 1113/CHEM 1114.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BCHM 4850</td>
<td>Therapeutic and Diagnostic Nucleic Acids</td>
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**Total Credit Hours** 21-29

1 Must be completed at CU Boulder.

Learning Outcomes
Upon completing the program, students will be able to:

- Master the foundational concepts of general and organic chemistry, including equilibrium, kinetics, bonding (covalent and non-covalent) and reactivity and apply these concepts to biological systems.
- Explain how biomolecules (DNA, RNA, proteins, lipids, carbohydrates and metabolites) are synthesized and control biological processes.
- Identify the factors that determine the three-dimensional structures of biological macromolecules (DNA, RNA, proteins), and membranes (including organelles) and explain how structure relates to function.
- Describe how cells sense their environment and use this information to regulate cellular functions such as DNA replication, gene expression, signal transduction, cell division and cell death.
- Develop a conceptual, mechanistic and mathematical understanding of biomolecular interactions, including binding and catalysis.
- Explain how energy is stored, transformed and harnessed in biological systems.
- Analyze data, interpret graphs, solve quantitative problems to interpret results of scientific studies. Evaluate the rigor and reproducibility of scientific results.
- Learn and apply the rigorous scientific methods on which (bio)chemical knowledge is built: making observations, formulating hypotheses, executing experiments, evaluating rigor and reproducibility.
- Effectively communicate scientific information in oral, written and visual formats to specialized and general audiences.