

# Molecular, Cellular and Developmental Biology (MCDB)

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Courses primarily for graduate students, open to qualified undergraduates:

**MCDB 511. Molecular Genetics.**

(Cross-listed with GDCB). (3-0) Cr. 3. S. Prereq: *BIOL 313 and BBMB 405*  
The principles of molecular genetics: gene structure and function at the molecular level, including regulation of gene expression, genetic rearrangement, and the organization of genetic information in prokaryotes and eukaryotes.

**MCDB 512. Plant Growth and Development.**

(Cross-listed with GDCB, PLBIO). (2-0) Cr. 2. S. Prereq: *BIOL 330 or a course in developmental biology; GDCB 545 or BBMB 404, BBMB 405 or GDCB 520*  
Plant growth and development and its molecular genetic regulation. Hormone biosynthesis, metabolism, and action. Signal transduction in plants.

**MCDB 520. Genetic Engineering.**

(Cross-listed with BBMB, GDCB). (3-0) Cr. 3. Alt. S., offered 2012. Prereq: *GEN 411 or BBMB 405*

Strategies and rationale of recombinant DNA technologies. The methodology of genetic engineering in basic research and implications for applied research will be considered. Topics include: basic tools of molecular cloning, targeted mutagenesis, fluorescent proteins, protein expression systems, and transgenic model systems.

**MCDB 528. Advances in Molecular Cell Biology.**

(Cross-listed with GDCB). (3-0) Cr. 3. Alt. F., offered 2012. Prereq: *Courses in general cell biology and biochemistry*

Cell biological processes including cell signaling, cell division, intracellular trafficking, biogenesis of organelles, cell adhesion and motility.

**MCDB 529. Plant Cell Biology.**

(Cross-listed with GDCB). (2-0) Cr. 2. Alt. F., offered 2011. Prereq: *BIOL 313, BIOL 314, BIOL 330 or BBMB 405*

Organization, function, and development of plant cells and subcellular structures.

**MCDB 533. Principles of Developmental Biology.**

(Cross-listed with GDCB). (3-0) Cr. 3. Alt. F., offered 2011. Prereq: *BIOL 314*  
Fundamental principles in multicellular development. Emphasis on cellular and molecular regulation of developmental processes, and experimental approaches as illustrated in classical studies and current literature.

**MCDB 545. Plant Molecular Biology.**

(Cross-listed with GDCB, PLBIO). (3-0) Cr. 3. Alt. F., offered 2011. Prereq: *BIOL 314, BIOL 330*

Organization and function of plant nuclear and organelle DNA; regulation of gene expression. Methods of generating novel genetic variation. Impact of plant biotechnology on agriculture.

**MCDB 590. Special Topics.**

Cr. arr. Repeatable.

Courses for graduate students:

**MCDB 676. Biochemistry of Gene Expression in Eucaryotes.**

(Cross-listed with BBMB). (2-0) Cr. 2. Alt. S., offered 2012. Prereq: *BBMB 404 or BBMB 501, BBMB 405 or BBMB 502 or GDCB 511*

Analysis of the biochemical processes involved in expression of eucaryotic genes and the regulation thereof, including RNA polymerase, transcriptional regulatory proteins, enhancers and silencers, chromosome structure, termination, RNA processing, RNA transport, RNA turnover, small RNAs translational regulation, protein turnover.

**MCDB 697. Graduate Research Rotation.**

Cr. 1-6. Repeatable. F.S.

Graduate research projects performed under the supervision of selected faculty members in the molecular, cellular, and developmental biology program.

**MCDB 698. Seminar in Molecular, Cellular, and Developmental Biology.**

(Cross-listed with BBMB, GDCB, MICRO, V MPM). (2-0) Cr. 1-2. Repeatable. F.S.  
Student and faculty presentations.

**MCDB 699. Research.**

Cr. arr. Repeatable.