

A Closer Look at Research Clusters

BIOLOGICAL SYSTEMS and TECHNOLOGY

Overview	Investigations into biological systems analyze the interactions between the components of a biological system and how these interactions give rise to the function and behavior of that system. The systems approach includes a combination of experiments to characterize cell processes at multiple levels (including cellular organelles, nucleus, metabolic pathways, transcription, translation) using computer modeling. Other technologies involved in the mapping of systems include modification of the system via altered components and visualization of the outcomes.
Focus of Research at UMass Boston	<ul style="list-style-type: none">• Cell Biology – Investigation of response to stimuli at both organism and cellular level in development and morphogenesis. Integration of pathways to systems knowledge deciphering morphogenesis and development. Also response to toxic, abnormal signals. Includes work in drosophophilia, yeast, and plants addressing cell signaling, development, morphogenesis, defense genes• Organism studies• Bioinformatics• Imaging technology (potential systems applications)• Synthetic chemistry of biological compounds (potential systems applications)
UMass Boston Departments Involved	<ul style="list-style-type: none">• Biology (molecular, organismic, cellular)• Computer Science• Chemistry (potential)• Physics (potential)
Collaborations Established and Potential	Boston University, Harvard University, Mass General Hospital. Can target towards significant pharma-biotech-medical device industry complex, plus support innovations in healthcare delivery.
Distinctive UMass Boston Approach	<ul style="list-style-type: none">• Investigators in organism and cellular biology are using elegant, cost effective research models that provide information at an organism level conducive to bioinformatics modeling.• Supportive programs in Chemistry and Physics for manipulation and visualization of model systems and moving into more medicinal chemistry applications.