What is USJ?

- An excellent opportunity for undergraduates to present and publish personal research findings
- Exposes undergraduates to the intricate UCLA research community
- Provides a new venue for interaction between faculty and students
How can you contribute to USJ?

- **Writers:** submit articles for publication
- **Staff:**
  - Managing Editors: Oversee the decisions and follow up on the layout of one major subdivision in the journal.
    - Research
    - Review
    - Layout
  - We are recruiting for all staff positions as well as Asst. ME, Reviews, Asst. ME, Research, Science Editor for Layout
What benefits will I get?

- Interaction with fellow undergraduates passionate about science and research.
- Learning about the research community at UCLA.
- Knowledge about the scientific writing and publishing processes.
- A great addition to resumes and applications.
How is USJ structured?

USJ articles are categorized into *two sections*:
- Review articles (7-10 articles)
- Research articles (7-10 articles)
Review Articles

- South Campus-oriented student group (e.g., UCLA Ocean Discovery Center, CityLab, Stroke Study)

- Issues impacting UCLA research arena (i.e., Nanotechnology, Hurricane Katrina, etc.)
The Nanotechnological Revolution: Inventions on the Atomic Scale

Another nanotechnological invention was made at UCLA by the research team headed by Professor Jeffrey Zink. His team invented nanorobots, potential gates for the controlled release of molecules. Their research involved the preparation of a nanorobot carrier that can hold molecules, the discovery of a way to entrain the molecule in the carrier, and a method to release the molecule upon a signal. This controlled assembly has been called "molecular mechanical," and is becoming very important in the field of nanotechnology (Espinosa et al., 2004).

The nanorobots, as shown in Figure 3, are red and blue orbs, are made of what have been called "molecular mechanicals," which are attached to the silicon surface. They contain DNA and the enzyme DNA polymerase. The DNA polymerase, as shown in the figure by yellow spheres, are nucleotides, specifically, adenosine (A), guanine (G), thymine (T), and cytosine (C). The DNA polymerase is responsible for the construction of the nanorobots.

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In order to realistically characterize that process, Dr. Zink's group utilized fluorescent spectroscopy. This is a technique in which electrons of a molecule are excited with light beams and thereby give off photons of lower energy, which are then measured with a spectrophotometer. The hydrogen molecule is more reactive than the nanorobots. Hence, their release can be monitored via spectrometry. Indeed, when the molecules were tagged, the intensity of their fluorescence was shifted to a lower wavelength than when they were labeled. Therefore, it was verified that the nanorobots truly open with the external signal. Particularly because of the external control option, this novel machinery can offer many possibilities for pharmaceutical and nanomedicine applications.

There are many other research laboratories at UCLA that continue to invent nanotechnological possibilities, with the advancement of new research only a few weeks away. Professor Zink, for instance, who is a professor of chemistry at UCLA, is one of the pioneers of nanotechnology. His most recent research involves designing self-directed motors that are powered by light. There are many other researchers who explore nanotechnology and its applications to various related fields, such as biotechnology and cell biology. A list of several UCLA researchers in the field of nanotechnology can be found at the California Nanosystems Institute (CNI) website.

Nanotechnological inventions are very challenging molecular engineering projects that require physical and chemical techniques as well as intricate design. Many inventions are necessary for putting together a completed nanotechnological system. Interestingly, throughout the billions of years of evolution, organisms have developed sophisticated molecular mechanisms such as enzymes. It is therefore unsurprising that scientists in the field of nanotechnology learn much from biochemistry in their work. The ultimate goal of nanotechnology, perhaps, is to entrain the biochemical machinery in order to develop better medicines and tools.

Figure 3. Single molecule sensor shown on gold surface. The arrow points to the direction of the molecule's motion. The four black dots are attached to the silicon surface when the molecule is bound to about 300-degree Celsius. Imaging studies using 300-nanometer light was used to measure the molecule's rolling motion (Zink et al., 2004).

Figure 4. Upper left: The nanorobots. Upper right: The nanorobots with molecules. Lower left: The nanorobots with DNA polymerase. Lower right: The nanorobots with DNA polymerase and fluorescent markers (Zink et al., 2004).
Research Articles

- Original research conducted by you, an undergraduate, and supported by a faculty advisor
- Article MUST be in scientific paper format—adhere strictly to our submission guidelines (can be found online: www.studentgroups.ucla.edu/usj)
- E-mail us, usjUCLA@gmail.com, with questions, comments, and scheduling conflicts
- Deadline: Wednesday January 12th, 2012 @ 4 PM in Life Science Building Room 2103.
Example
Want to publish?

- Submission Guidelines can be found on our website: www.studentgroups.ucla.edu/usj
- Submission Guidelines must be STRICTLY FOLLOWED (failure to do so will cause everyone trouble and trips back to the office…)
- E-mail us at usjUCLA@gmail.com with questions, comments, and schedule conflicts
Course Credit

- Honors Collegium 101B
  - 2 units, P/NP, Honors credit for working on USJ
  - Winter Quarter
  - Workshops on Reviewing Articles Critically and more.
Important things to note:

- Review article writers can choose from a pool of topics.
- Please note: submission deadline is **Thurs. Jan. 12, 2012**
- USJ cannot guarantee that all research articles submitted will be published
Timeline

- **Now to Jan. 12, 2012:**
  - Write and submit Research articles, Review articles
  - Jan. 12, 2012: Due date for ALL articles

- **Jan. 12, 2012 to March 2012:**
  - Editorial Board and Review Board, Writers revise article (everything turned-in by Spring Break)

- **End of March 2012 – May 1, 2012:**
  - Managing Editor layout/design, final revision by faculty and editors

- **May 1, 2012:**
  - Send to Print (4-6 Weeks)

- **June - Release date for Vol. 25**

- **June - End of the year Banquet!!!**
Contact USJ

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- Co-Editors-in-Chief:
  - Jeffrey Lin
  - Kimberly Loo
From USJ…to you

Thanks for attending this meeting. We look forward to working with you this year.

Submission Deadline for Articles:
Thursday January 12\(^{th}\), 2012 @ LS 2103

Application Deadline for USJ Staff:
Wednesday November 2\(^{nd}\), 2011 @ LS 2103

*** Everything must be turned in by 4 PM.***