

Advanced Network Infrastructure Critical Element for Biomedical Research

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NIH Connection to National Research and Education Networks (NRENs)

- Successful research depends upon many things
 - Network connections to others is very important
 - NIH is well positioned
 - NIH consists of 27 Institutes and Centers
 - Including NCI and NLM
 - Has 10G connection to I2 and other NRENs
 - 100G core transition underway
 - NIH/NLM has separate 100G to Internet2 and NREN community since 12/2013
 - 5-10 Gbps flowing out of NLM 24 hours per day



Research Resources

- Successful research depends upon many things
 - Access to biomedical information resources
 - NLM is largest medical library in the world
 - Free, available 7x24, www.nlm.nih.gov
 - Includes NLM/NCBI's genomics databases for public sharing of sequencing data
 - Always improving services!
 - Recently (released 2/2012, 20k visitors daily)
 - **Visual** and/or text search:
<http://openi.nlm.nih.gov>
 - Multimodal (text + image) search engine retrieves enriched citations from open access biomedical literature.
 - Currently indexes: **>2.2M images and >758,000 biomedical articles** from NLM's PubMed Central® repository
 - **Attention: Nanotech R&D Groups!**
 - open! available for your collection!!!!



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Research Resources

Multimodal search on “nanotech”=>
<http://openi.nlm.nih.gov/gridquery.php?q=nanotech&it=yo&sub=ho>

The screenshot displays the Open Image Library (OpenI) search results for the query "nanotech". The interface includes a search bar at the top with the query "nanotech" and a "view as" option. Below the search bar, there are filters for "Selected Limits: Clear All x Image Type: Exclude G". The main area shows a grid of image thumbnails under the heading "limits: Rank By Image Type Subsets Collections License Type Specialties Search In".

The thumbnails include:

- A schematic diagram of nanotechnology applications in medicine, showing various nanomaterials and their interactions with cells and tissues.
- Fluorescence microscopy images of A2780CP and MDA-MB-231 cells, showing DNA binding sites (DAPI) and FITC-labeled nanomaterials (FITC).
- A schematic diagram of a skin cross-section, showing the stratum corneum, epidermis, dermis, and basement membrane.
- A diagram of a villus structure, showing capillaries, micro-villi, and blood vessels.
- A series of five images (a) through (e) showing the interaction of a DNA binding site with a chain expanded polymer, illustrating the transition from a collapsed state (T < LCST) to an expanded state (T > LCST).



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