

SOCIETAL AND LEGAL ISSUES RAISED BY NANO PATENTS

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This material is based upon work supported by the National Science Foundation (NSF) under grant SES-0508321 and the Office of Science, U.S. Department of Energy (DOE) under Award Number DE-FG02-06ER64276

Research Activities and Methodologies Used

Review of case law, statutes, scholarly articles, scientific articles and all patents claiming quantum dots.

This allowed analysis of the societal and legal issues raised by patents on nanotechnologies and the impact intellectual property law would have on the development and use of nanotechnologies.

State laws governing nanotechnologies focus almost exclusively on funding aspects.



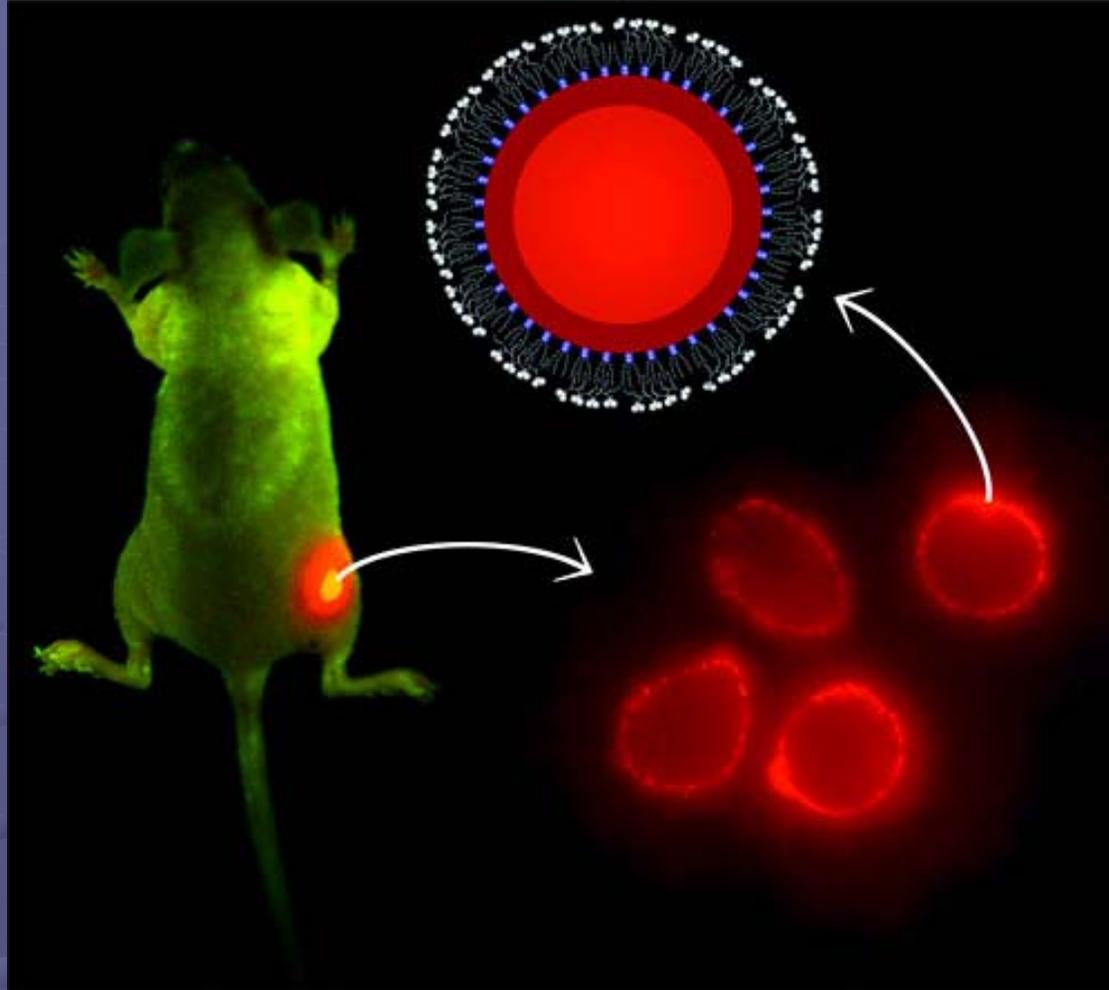
Arkansas provides a tax credit for up to half the cost of the purchase or construction of a facility which designs or develops devices which are reliant upon nanotechnology.

Ark. Code Ann. § 15-4-2104 (West 2006)

The number of nanopatents has been overestimated by prior researchers.

A prior researcher's search for patents containing "nano" resulted in 96,000 hits.

We searched three decades of the USPTO's electronic patent database for patents with **quantum dot** or **nanocrystal** in their title. We found 280 patents with a total of 5,675 claims.



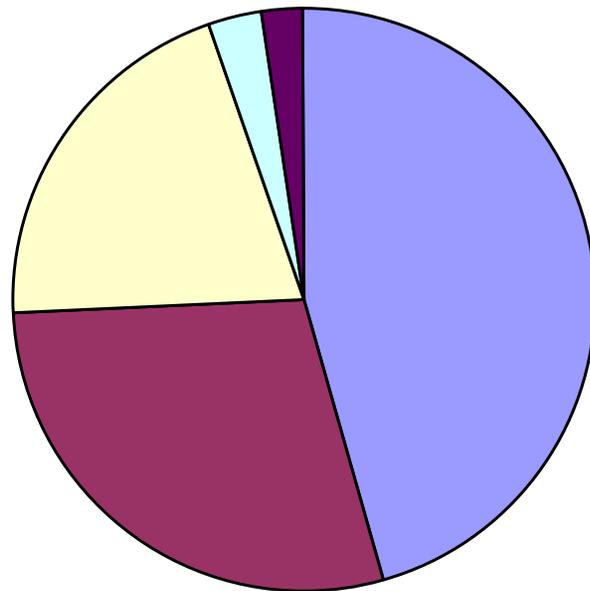
Fluorescent image of a mouse injected with cancer cells tagged with red-emitting quantum dots, quantum dot-tagged cancer cells, and a single cell in which the individual quantum dots are visible (courtesy of Shuming Nie)

280 patents issued between July 1976 and July 2006 claim quantum dot technology:

17.9% claim particles over 100 nanometers and therefore do not meet the NNI's well-known definition of "nanotechnology."

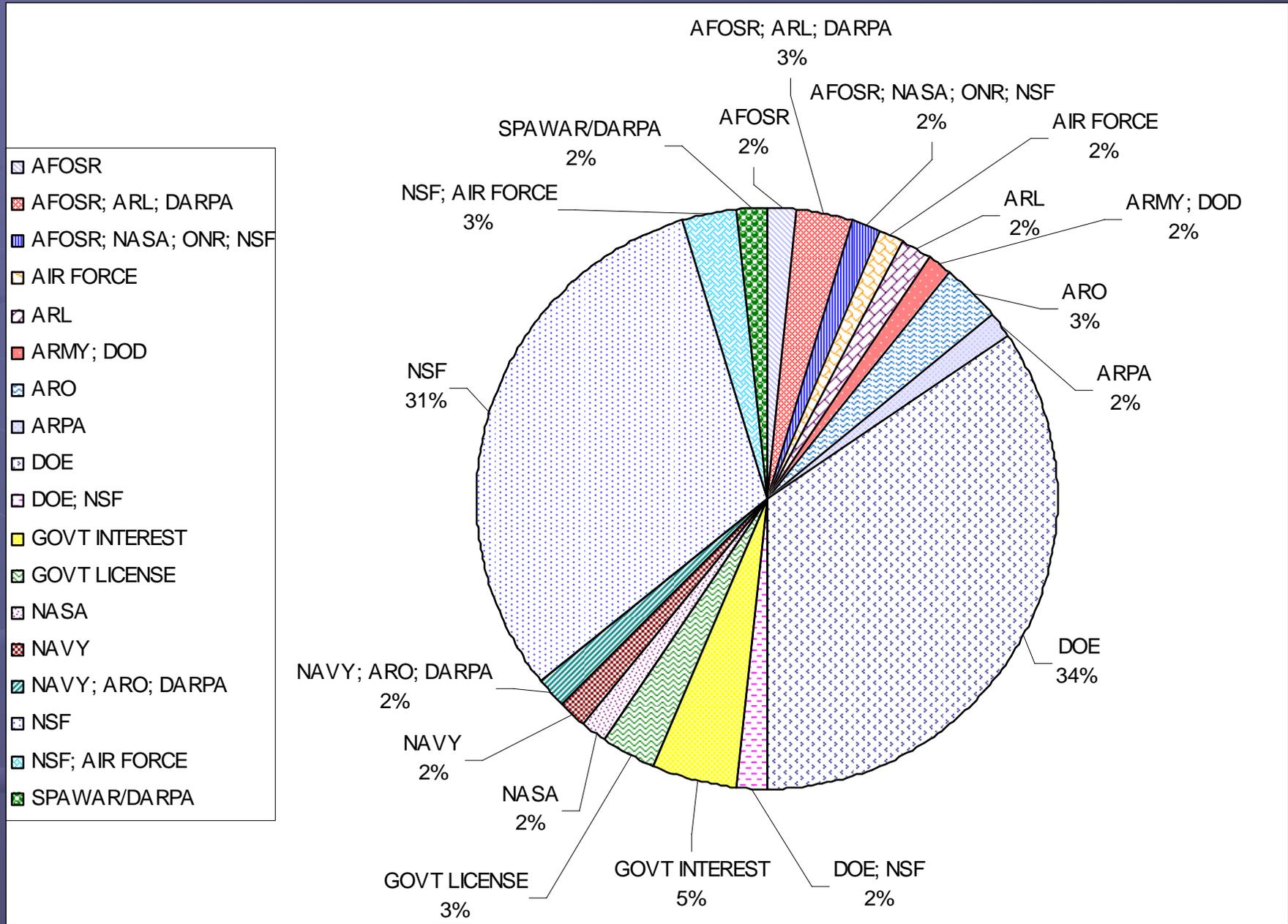
27 months was the average time from date of application to date of patent issuance.

Of the 5,675 claims in patents that contain “quantum dot” or “nanocrystal” in their title....

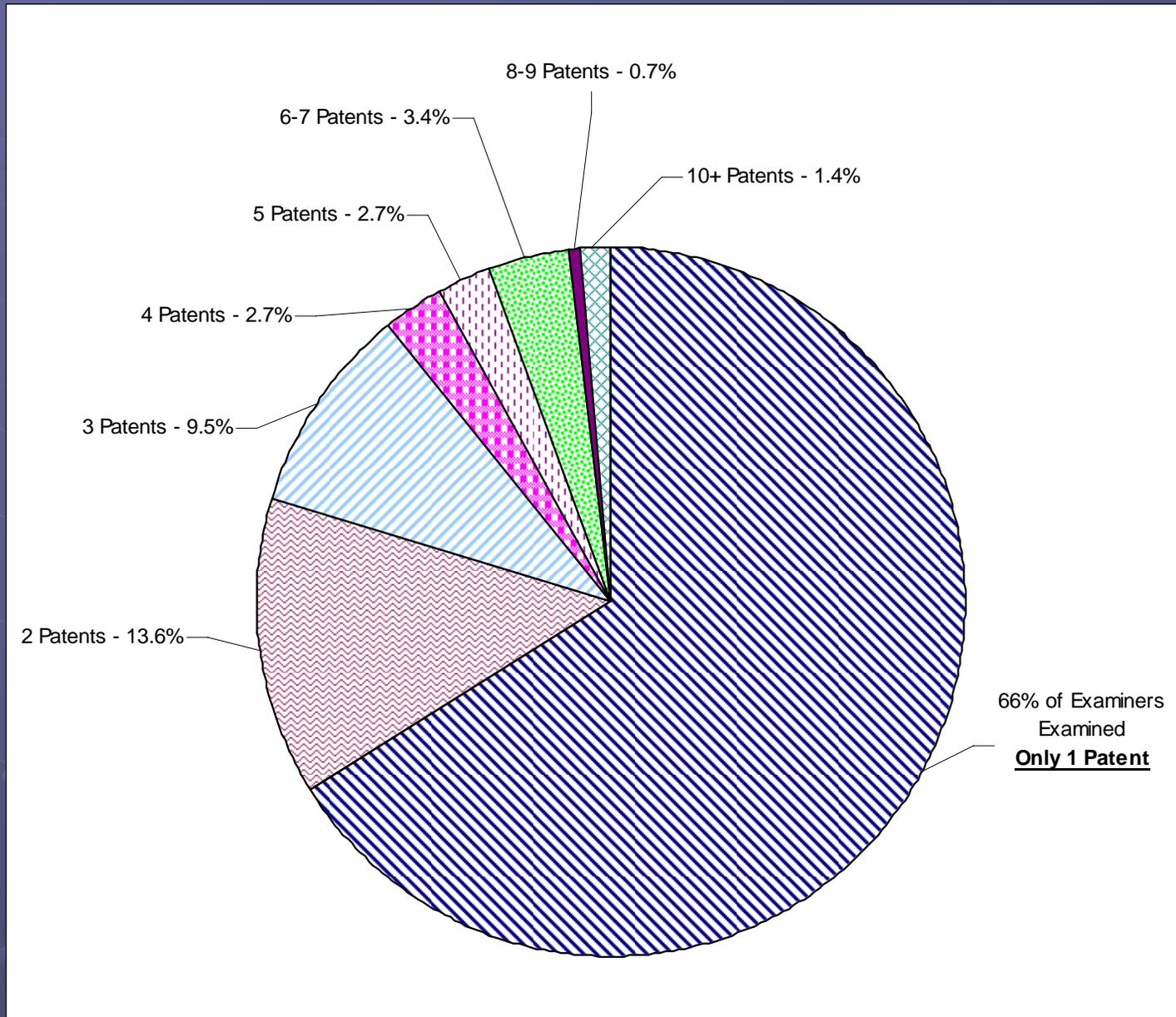


- Process or method claims - 45%
- Manufacture or machine claims - 28%
- Composition of matter claims - 20%
- Improvement thereof claims - 3%
- Product by process claims - 2%

Funding of Quantum Dot Patents Per Federal Agency



Examiner Experience





The application of certain aspects of patent law
(such as the strict liability standard for infringement)
to nanotechnology is problematic.

Government agencies are applying inconsistent approaches to nanotechnology.



Examples: Bone implants; Antimicrobial silver wound dressings

Publications

- Lori Andrews, J.D., Jordan Paradise, J.D., Timothy Holbrook, J.D., and Danielle Bochneak, B.S.E., “When Patents Threaten Science,” Science (December 1, 2006).
- Julie A. Burger, Marianne R. Timm, and Lori B. Andrews, “Nanotechnology and the Intellectual Property Landscape,” in Nanoscale: Issues and Perspectives for the Nano Century (edited by Nigel Cameron and Ellen Mitchell) (Hoboken, New Jersey, John Wiley and Sons, Inc., forthcoming 2007).
- Jessica K. Fender, “Patenting Trends in Nanotechnology,” in Nanoscale: Issues and Perspectives for the Nano Century (edited by Nigel Cameron and Ellen Mitchell) (Hoboken, New Jersey, John Wiley and Sons, Inc., forthcoming 2007).
- Marianne R. Timm, “Nanotechnology: U.S. State Government Promotion Through Legislation,” Nanologues, Series 3.2006.
- Letter from Lori Andrews, *et al.*, Institute for Science, Law & Technology, to The Honorable Jon Dudas, Director, United States Patent and Trademark Office (July 31, 2006).