Nanopublications

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Designing a System for the Future of Scientific Communication

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Motivation: Fictitious Scenario

Isabelle, a researcher in the biomedical area, comes to think of the possibility that gene X might accelerate the late stage of the course of disease Y, and she decides to investigate this further.

The first questions she faces are:

- Has somebody else thought of this?
- If so, is it an established fact or an open question?
- How much evidence is there on either side?
- Who has worked on this question and what are their positions?

Currently, answering these questions takes hours, probably days.

Can we design a system that can answer these questions instantly?

General Motivation

The key problem of the current system of scholarly communication is that it is centered around narrative articles:

- They are good for individual consumption by human beings but very bad for aggregation or automatic processing
- They are very ineffective for sharing scientific information, especially in data-intensive sciences
- There are no rewards for providing, sharing, and maintaining datasets, software, and other digital artifacts

The current system is slow and inefficient.

Nanopublications have been proposed to solve these problems: they are minimal portions of scientific contributions in a formal notation.

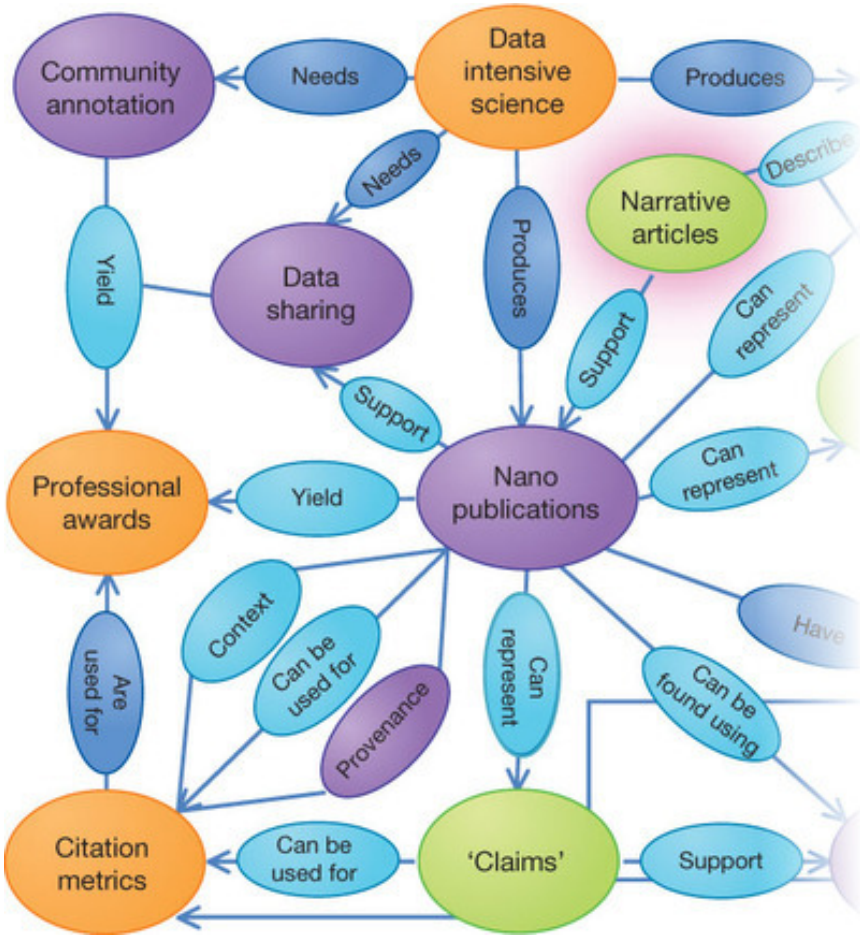
Vision: Changing Scholarly Communication

Now

Narrative articles at the center

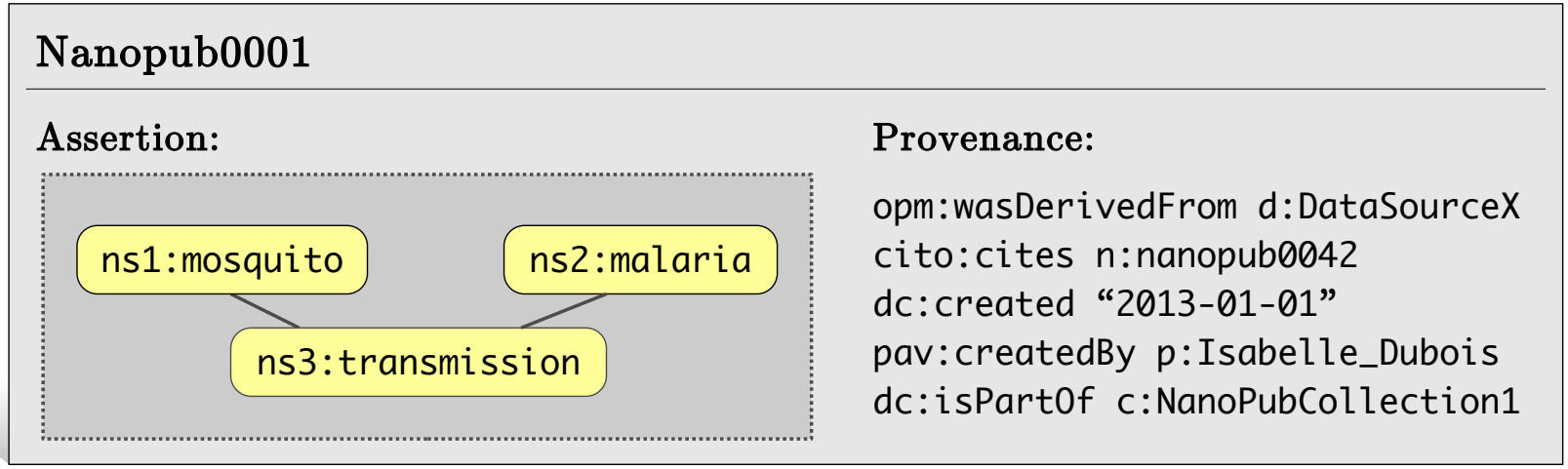
Future

Nanopublications at the center



Images from Mons et al. The value of data. *Nature genetics*, 43(4):281–283, 2011

Structure of Nanopublications



Assertion:

- Formalized scientific claim (or hypothesis)

Provenance:

- Reference to article, experimental methods, etc.
- Who published it when and how

Proposed Extension 1: Informal Assertions

Nanopub0012

Assertion:

Malaria is transmitted by mosquitoes.

Provenance:

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opm:wasDerivedFrom d:DataSourceX
cito:cites n:nanopub0042
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pav:createdBy p:Isabelle_Dubois
dc:isPartOf c:NanoPubCollection1
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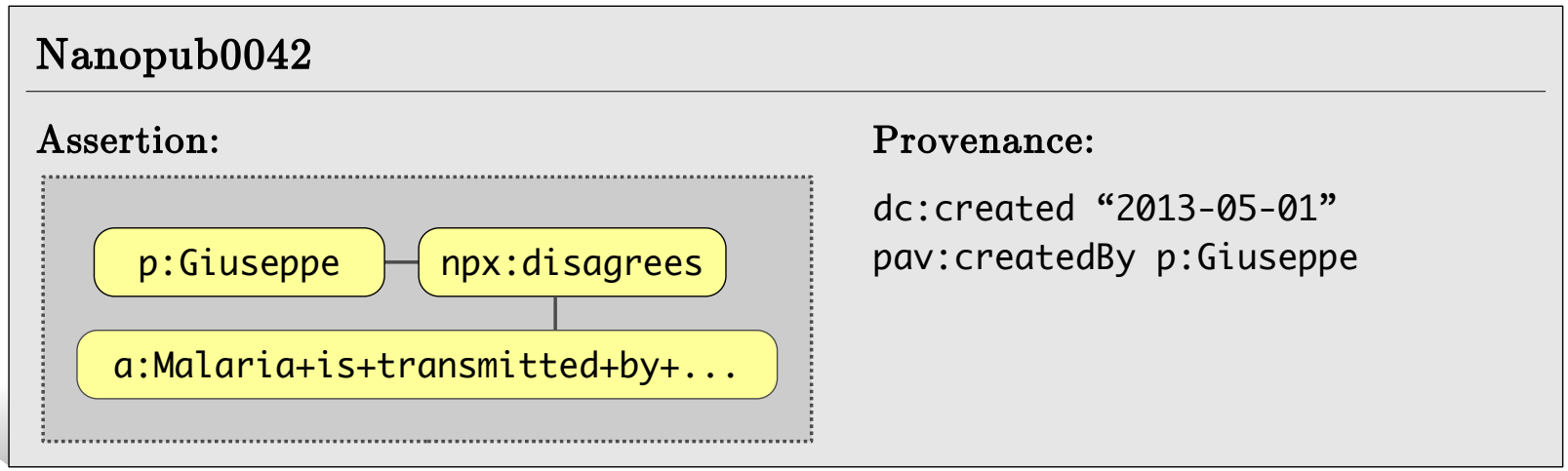
Assertion:

- Informal English sentence
- Sentences are independent entities and represented by URIs:
  `http://purl.org/aida/Malaria+is+transmitted+by+mosquitoes.`

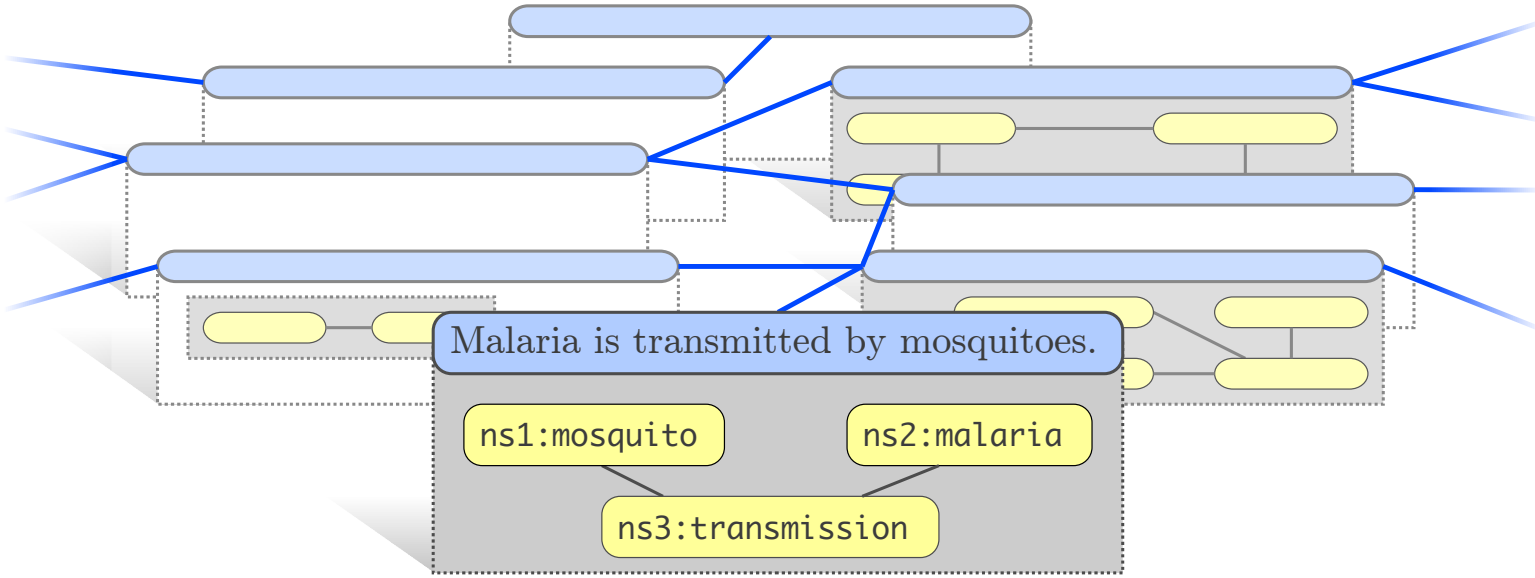
Proposed Extension 2: Non-Scientific Assertions



Assertion:

- Meta-statement or other non-scientific assertion
- Can include opinions, social relations, introduction of new entities, ...

Linking Scientific Claims

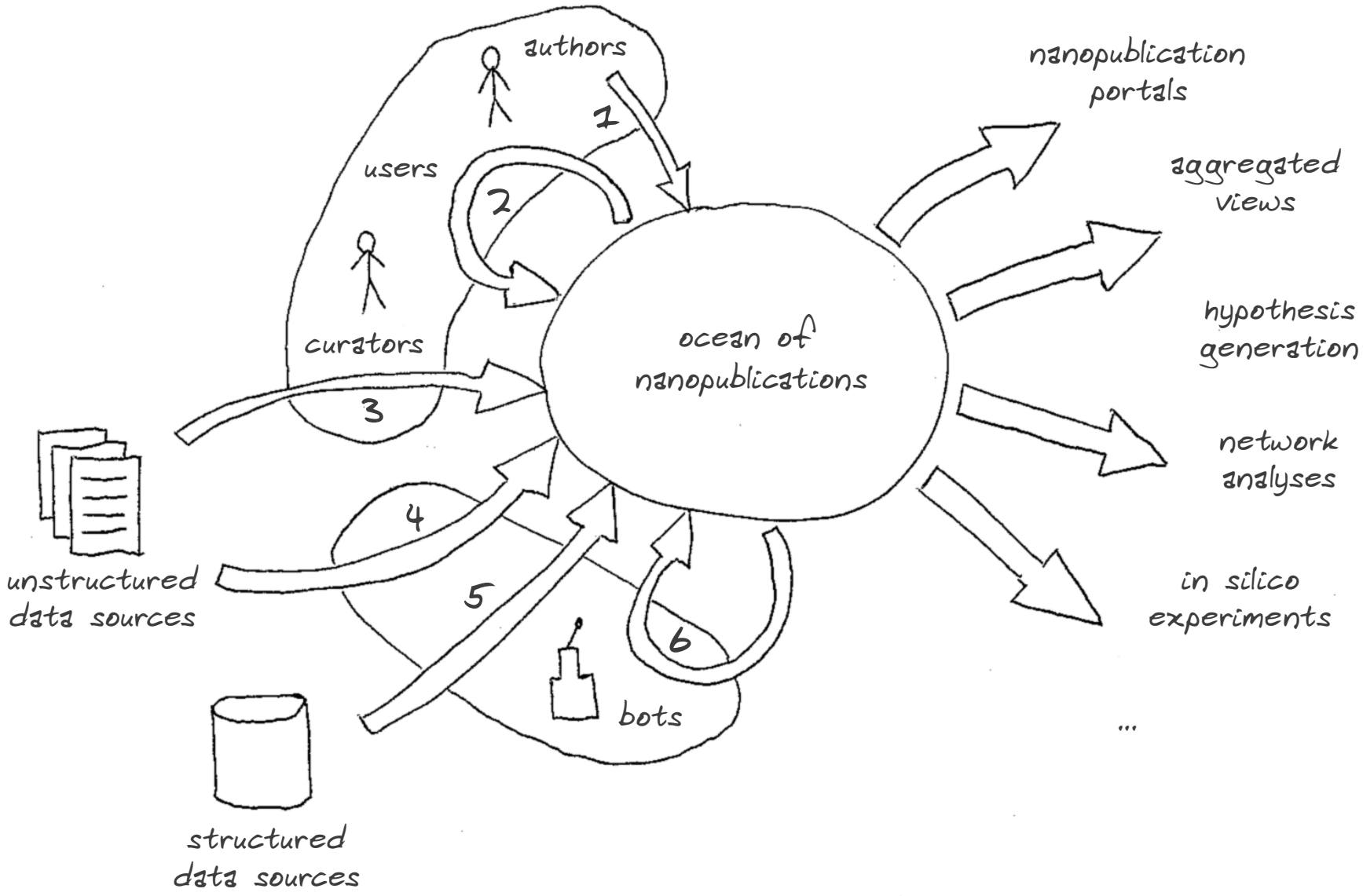


Possible relations:

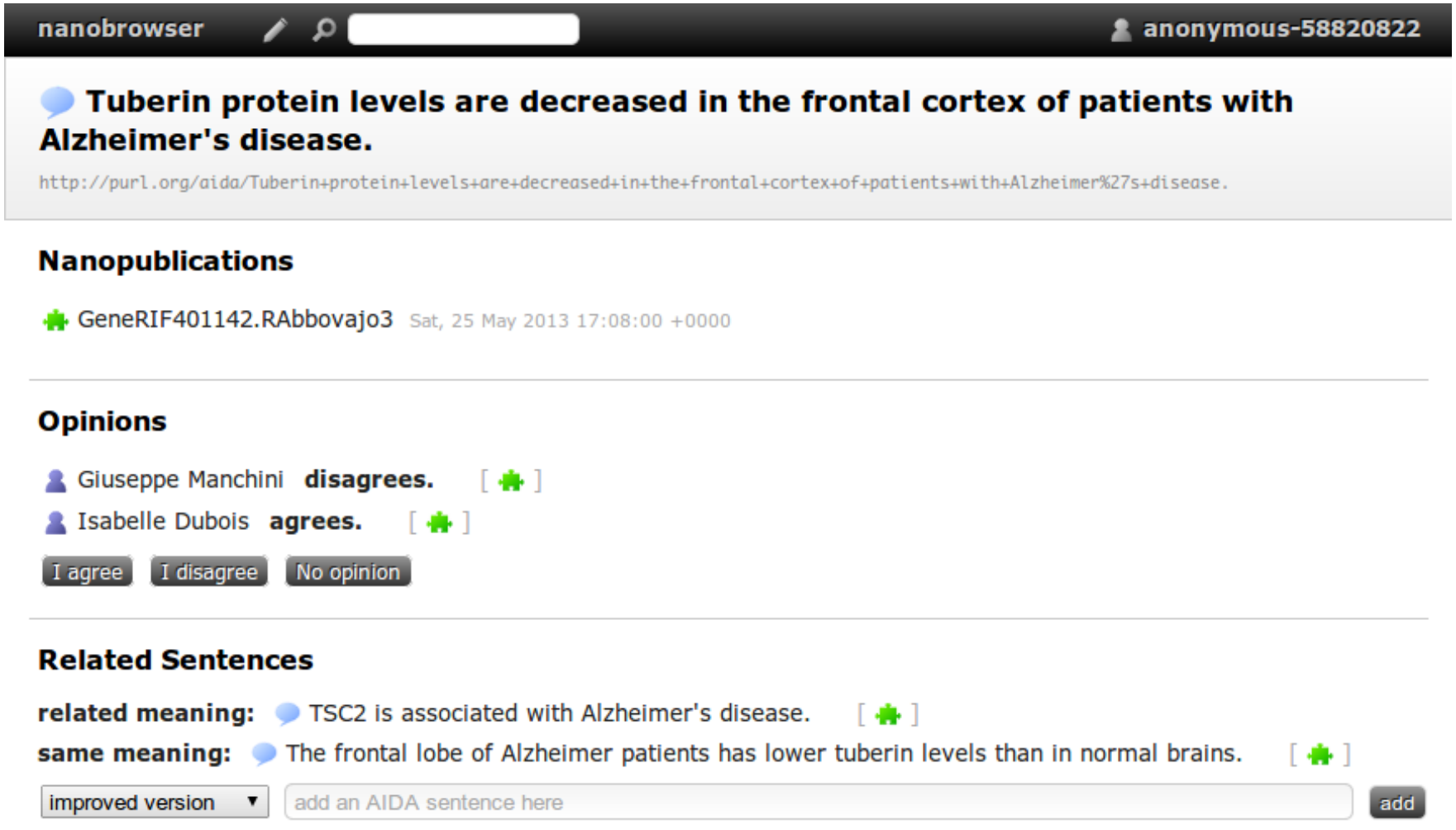
- [CLAIM] is equivalent to / contradicts / is similar to [CLAIM]
- [PERSON] agrees with / disagrees with / challenges [CLAIM]
- [STUDY] provides (counter-)evidence for [CLAIM]

These relations can be published as nanopublications too!

Ocean of Nanopublications



Nanobrowser



http://nanobrowser.inn.ac

https://github.com/tkuhn/nanobrowser

Thank you for your Attention!

Questions?