ChemRxiv: The Preprint Server for the Chemistry Community

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Preprints and chemistry: precedent, unresolved issues

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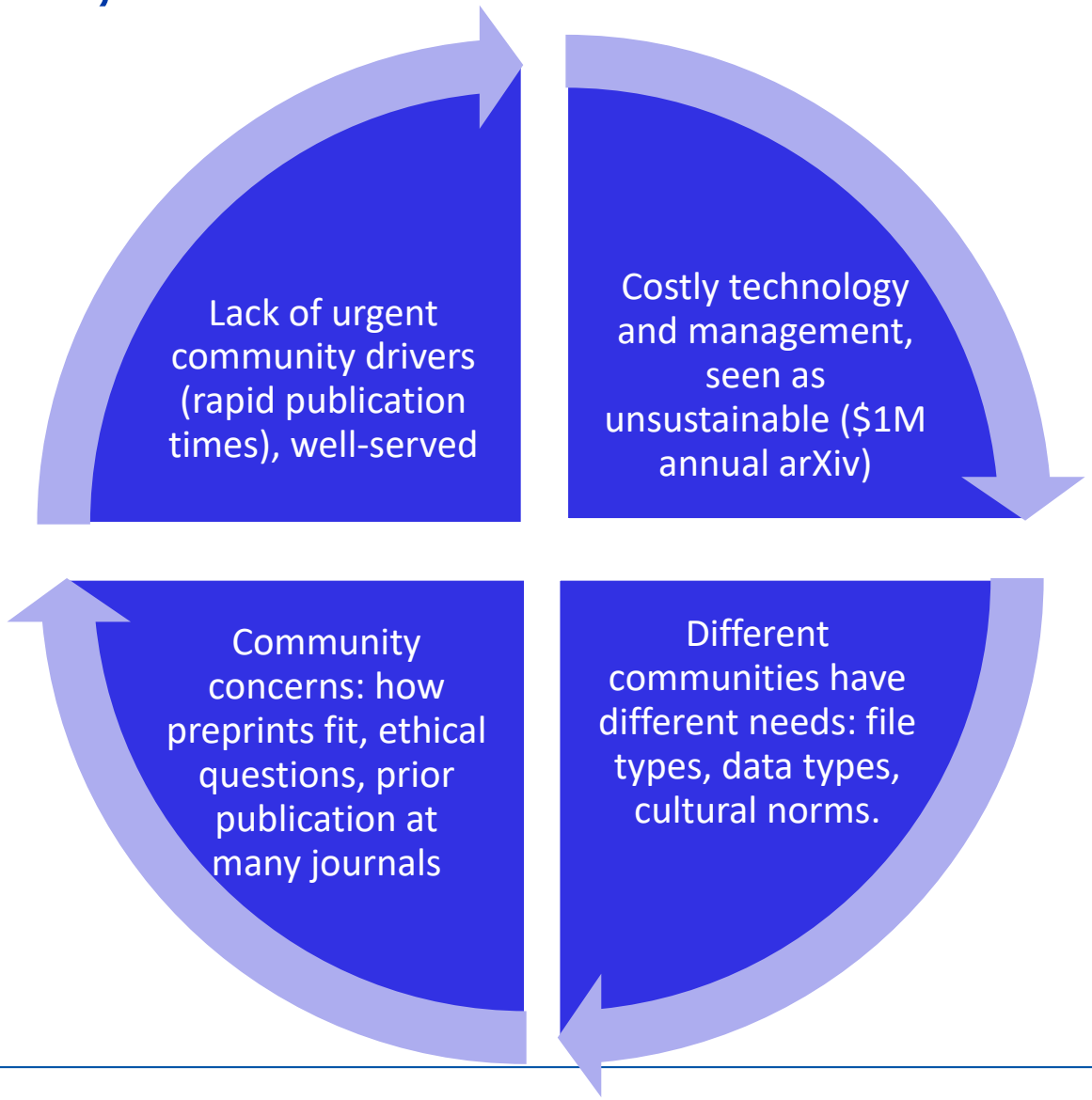

Preprint R&D Phase

Found our bearings:

- Re-invigorated research in preprints
- Logical piece of the chemistry communication cycle
- Clear that successful preprint servers are a community effort

Challenged existing assumptions

- Old: Community uninterested, chemistry journals publish rapidly.
- New: Many (not all) are now willing to experiment. Recognize additional benefits beyond improvements in time to publication

- Old: Preprints have unsustainable costs.
- New: Technology solutions make costs more manageable.

Focused on the value we (and our partners) bring

E.g., Core assets ACS is known for:

- Quality and ethical peer review and publishing
- Streamlined simple submission, peer review, and publishing
- Community-led processes, practicing research scientists
- Strong discoverability - smart systems, global reach

Press Release August 10, 2016: https://bit.ly/2JqXVsa

Preprint R&D Phase

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Engaged. Everywhere. Continuously. Ongoing. Integral.

- Practicing chemists: >100 meetings and phone interviews, 50+ surveys with ACS Journal Editors, technical ACS Divisions
- Journal Editorial board meetings, visiting and talking with other journals outside ACS, engaging with societies (>500 practicing research editors around the globe, >1000 EAB members)
- With bioRxiv, arXiv, other societies, publishers, funding agencies, initiatives (ASAPbio) or interested parties in this space
- PR in August 2016 invites other participants to the table, opens door to broader feedback

Committed to Think Sustainably. From the Beginning.

- Don’t assume it has to work the way it always has. Be willing to experiment. Collected broad responses to RFP
- Evaluated sustainability issues over a 5-10 year period, identified key costs that needed to scale and mapped out plans to address

Why chemistry authors care about preprints

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- **Broad engagement before publication** can improve manuscripts that are then submitted and published in journals**.**
- **Share urgent information, data, and new findings** with communities months before publication, **may relax time pressures during peer review process**
- Find others in similar areas for **collaborations** or discussions
- Document research results, provide scholarly credit for **grant reviewers, employers** prior to publication
- **In some cases, establish priority** of a discovery (providing a timestamp)
- **Attract attention** of journal editors, journalists to important work
- In some recently emerging cases, **because their funders care**
- **Speed up science** – rapid evaluation of controversial results

Why chemistry funders care about preprints

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- **More rapid dissemination** of research advances they funded
- **Speeds up science**
- **Improves collaborations**
- **Improves grant assessment**, fellowship reviews, particularly for starting career scientists who have less time to build repertoire – better information than "manuscript submitted" or "paper in press"
- Gains research and researchers they funded **broad exposure** consistent with public access policies and goals
- **Does not preclude nor replace the importance of validation** through peer review and publication in authoritative journals, anticipate grant renewals will take this difference into consideration

54,000 members

Combined, ChemRxiv governance today already represents <u>>234,000</u> member chemists

>30,000 members

>150,000 members

Press Release March 20, 2018: https://bit.ly/2vJN7Ds

Scholarly societies bring great value to governance of a preprint server

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1. **Mission-led, skilled.** Missions, visions, and skillset center around engaging, educating, informing the community, organizing and advancing the fields they represent.

2. **Community-led, diverse.** Well-known for coordinating community-led governance and best practices, established infrastructure and experience, aware of diversity needs and biases and seek for representative status. Can reduce the signal to noise of a less focused service.

3. **Sustainability-centered.** Driven to focus on sustainability, experienced strategies ready

4. **Social change drivers.** Well-positioned for innovating, experimenting, and addressing community challenges – social, publishing, communication, and technological

5. **Non-profit** versus commercial can positively impact community perceptions, ease concerns, and allow creation of community-wide, community beneficial resources

TRUST

ChemRxiv Beta: Simple Two-Step Process to Submit

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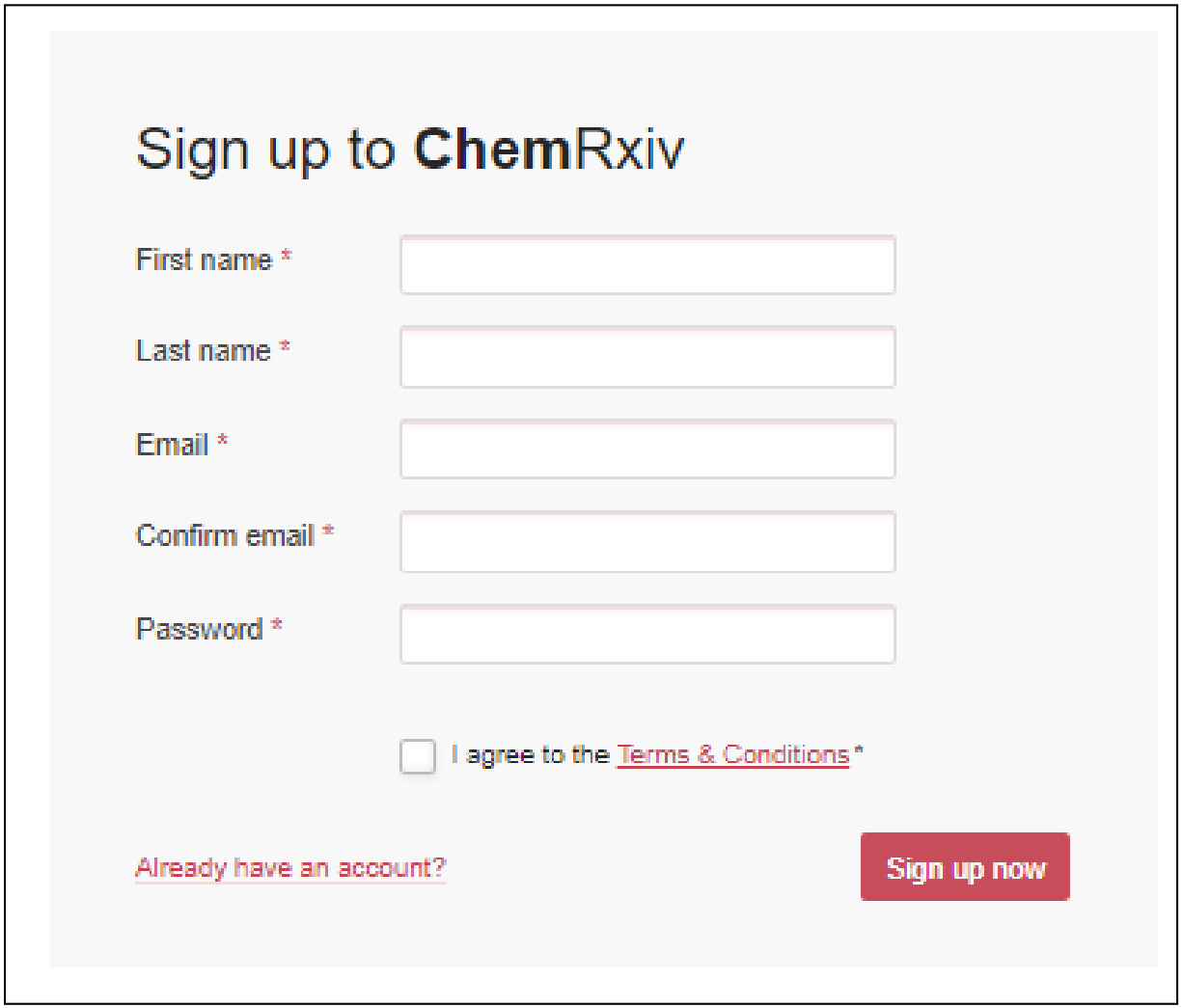
Step 1: One-time Sign up



Press Release August 14, 2017: https://bit.ly/2vKhqKb

Simple Two-Step Process to Submit

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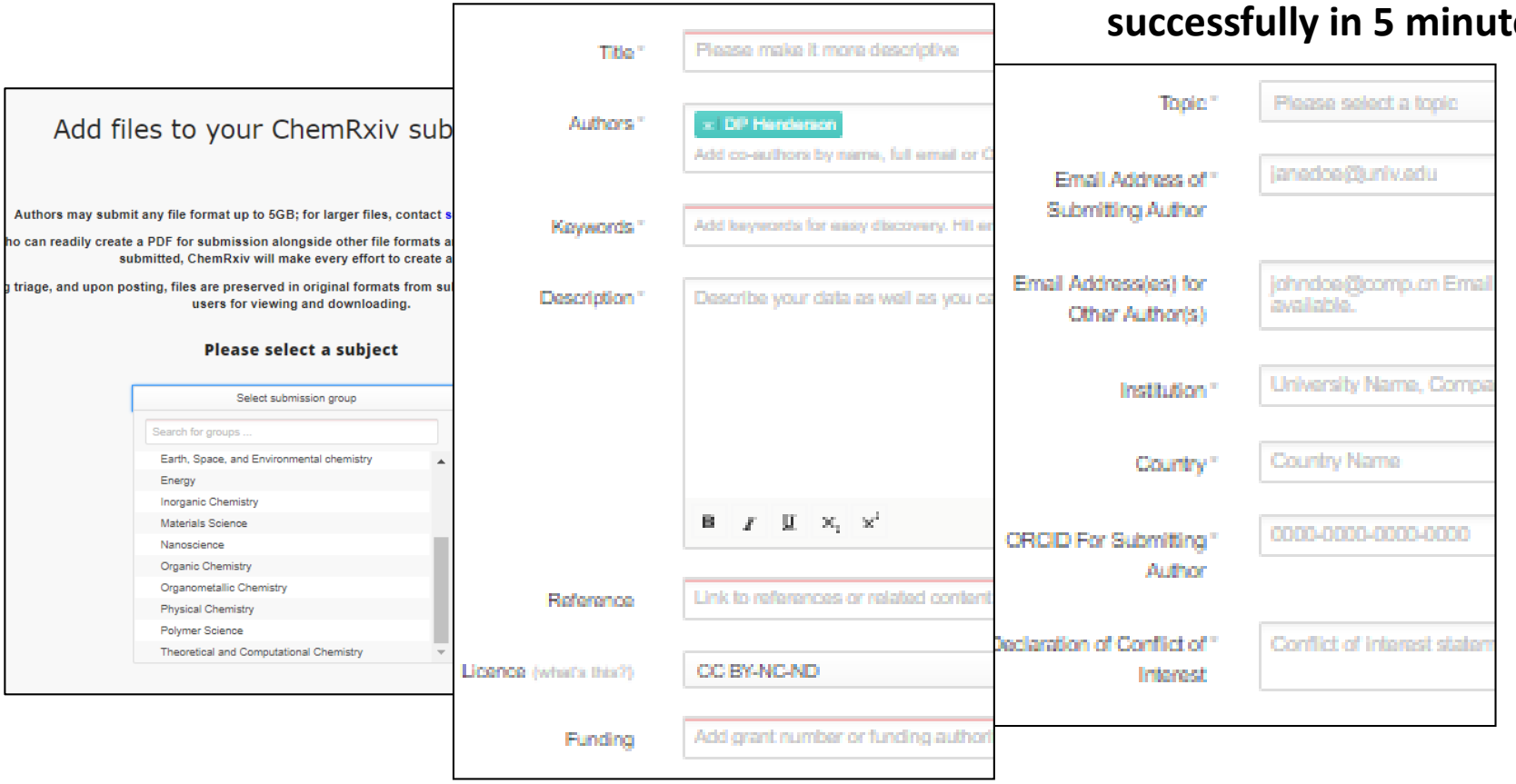
Step 2: Submit
(one screen, drag/drop)

Authors report they can submit a preprint to ChemRxiv successfully in 5 minutes.



Authors can track the status and progress of their preprint

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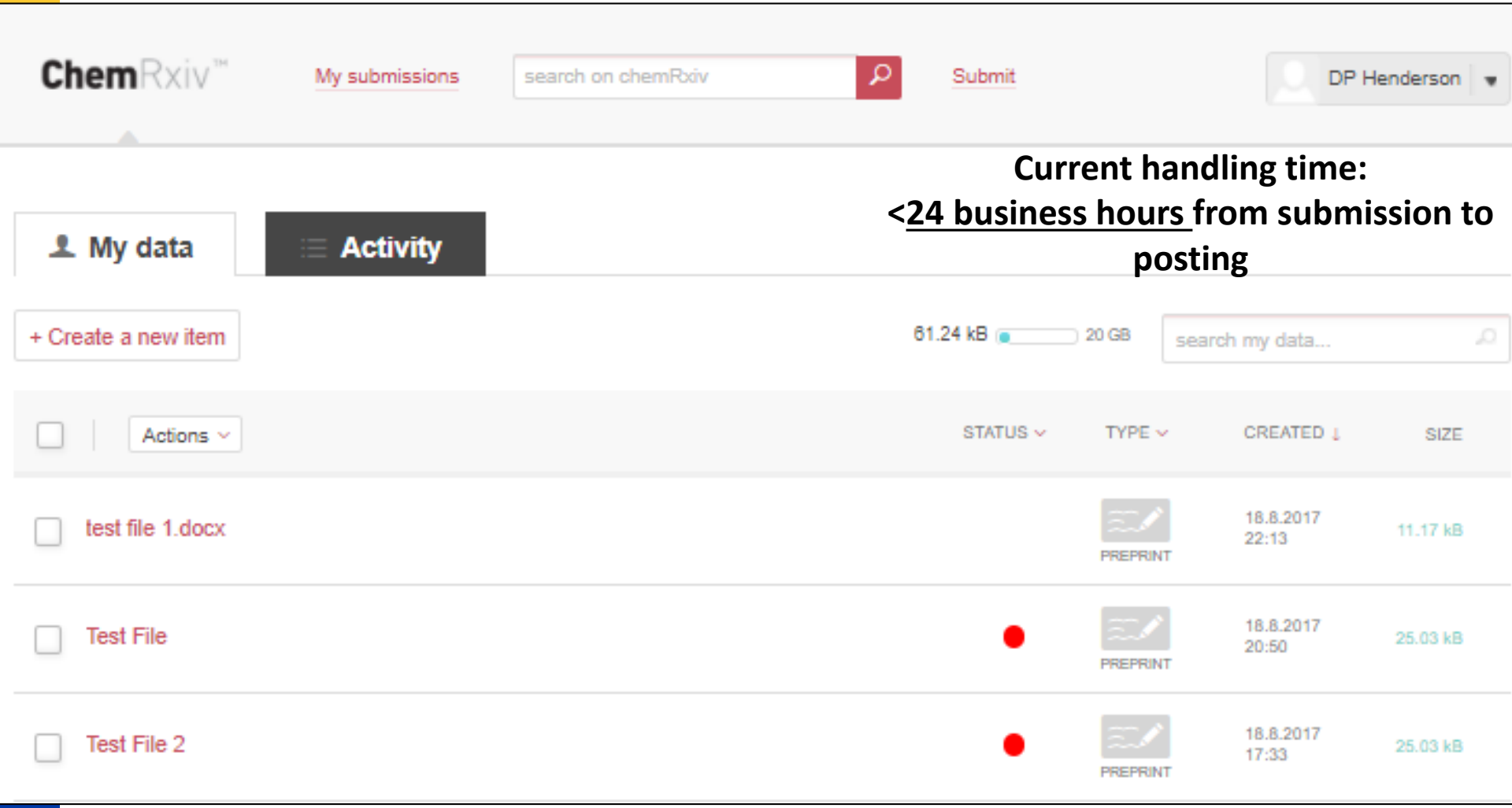

Current handling time:
<u>24 business hours</u> from submission to posting

ChemRxiv management and triage

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Dr. Marshall Brennan
Publishing Manager, ChemRxiv
@ChemRxiv

Applying the appropriate level of triage and helping ensure trust

Triage at ChemRxiv:

- ❑ Science (is this science? chemistry related?)
- ❑ Plagiarism or previous publication (iThenticate) – ChemRxiv focusing on content not already published to provide sustainable path forward for preprints and avoid community confusion
- ❑ Identify offensive, dangerous content for further checks or exclusion
- ❑ Proper subject categorization of content
- ❑ Ensure files are readable and viewable

Is Triage at ChemRxiv the same as peer review at a journal?

No. Most journals conduct the same checks as triage above. However, at ChemRxiv, no assessment is made of the accuracy, completeness, or import of the science.

ChemRxiv: Preservation, integrity, user features

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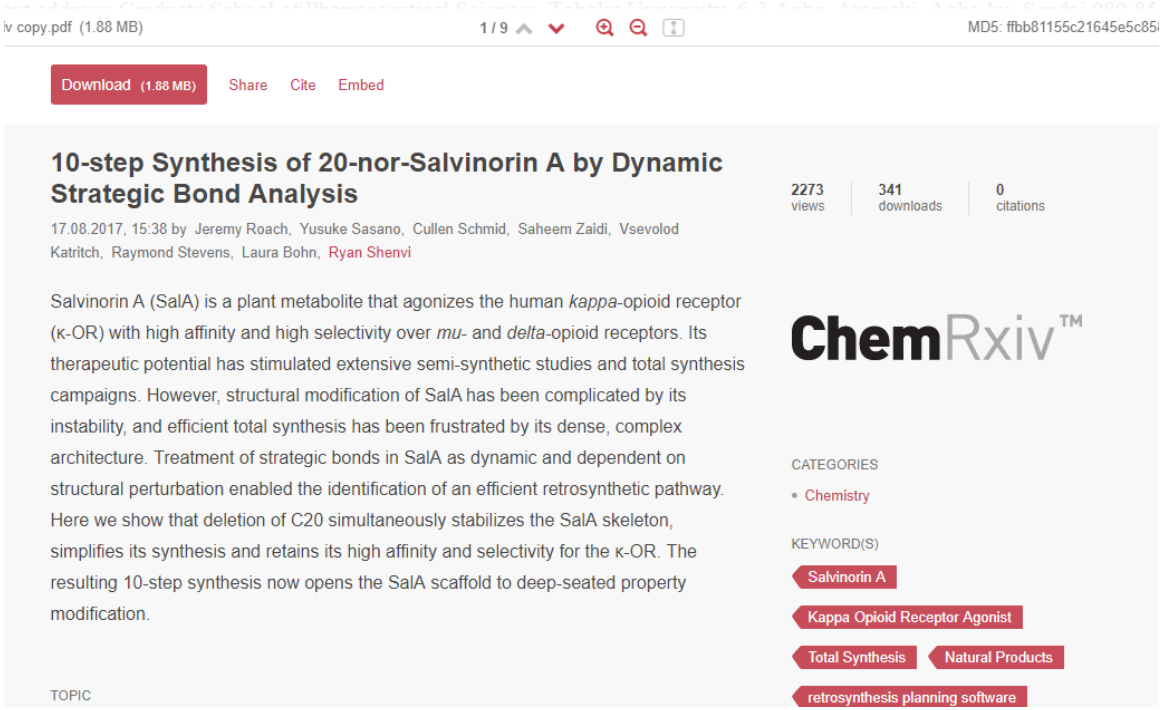

Preservation and Integrity

- **Preprints assigned DOI**
- EVERY preprint version is time/date stamped, viewable
- **Preprints cannot be taken down by authors**, however, may be removed by ChemRxiv in cases of ethical, safety, privacy, or copyright issues
- ChemRxiv establishes links between preprints and later published articles

User Features

- **100% of content free to all users, no requirement to login**
- **Users can view and download ALL file types submitted by authors**
- Users can download citations in hundreds of journal styles as well as and reference manager formats
- Users can share links via twitter, Facebook, linkedin, email
- Users can navigate through a taxonomy they are already familiar with – from CAS
- Open API compatible – full documentation, Open API Swagger specifications available
- Will support OAuth 2.0 Authorization Framework (specific tokens coming soon)

ChemRxiv: user-friendly, community driven

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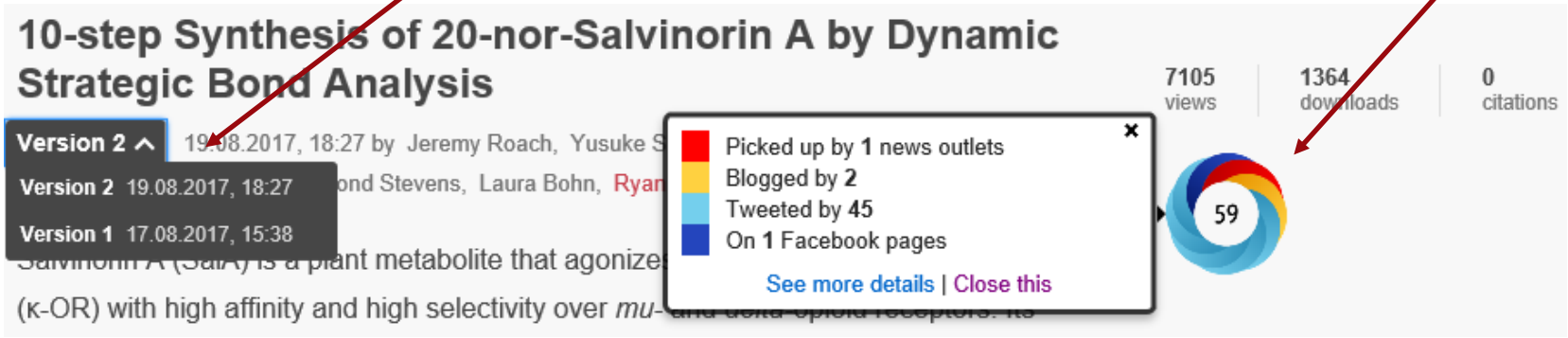
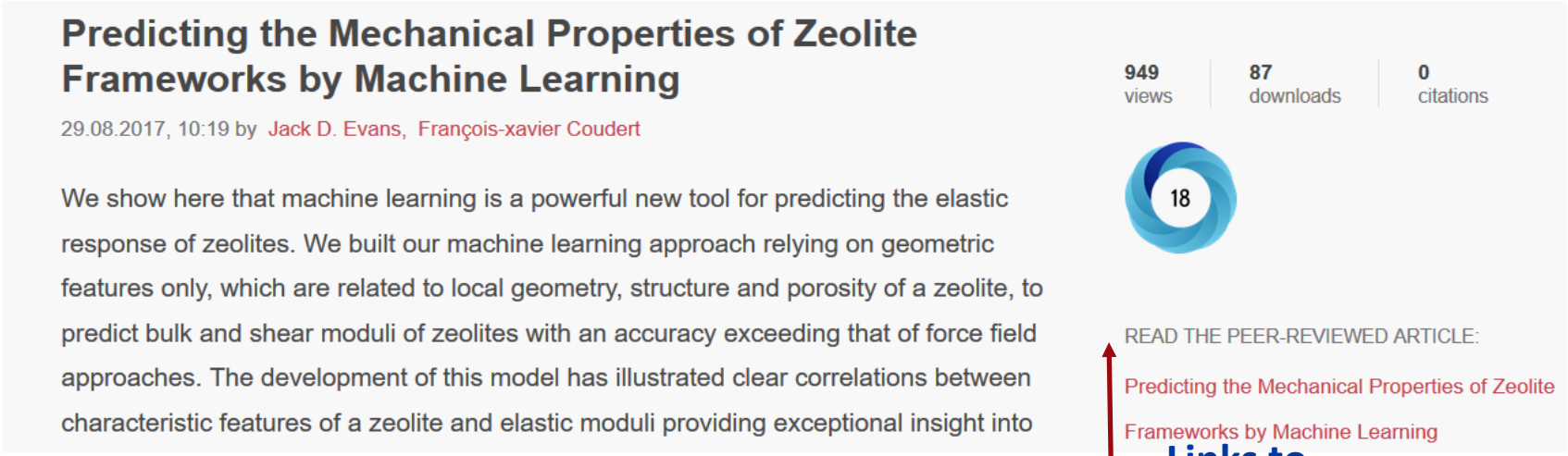
Date/time stamp and citable DOI

Usage metrics and Altmetrics





Links to published version

Data types appearing in ChemRxiv

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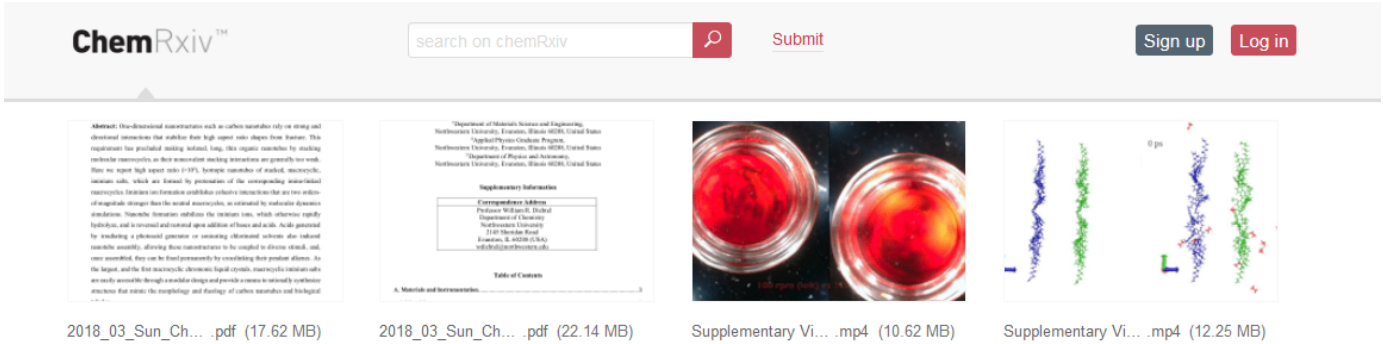
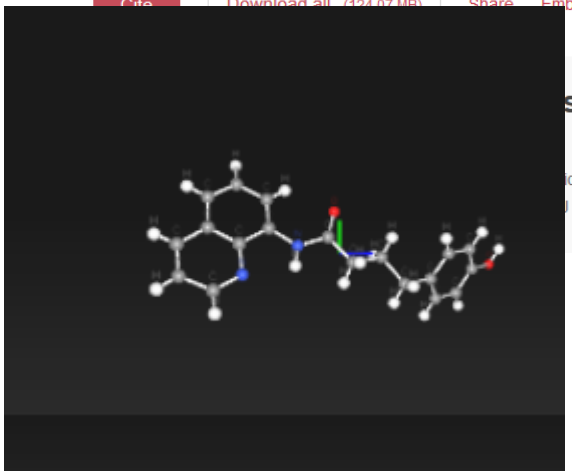
Provide valuable information not delivered in PDF or other formats, support claims, reduce duplicate efforts





```
12
benzene example
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  H          0.00000          2.49029          0.00000
  C         -1.21479          0.70136          0.00000
  H         -2.15666          1.24515          0.00000
  C         -1.21479         -0.70136          0.00000
  H         -2.15666         -1.24515          0.00000
  C          0.00000         -1.40272          0.00000
  H          0.00000         -2.49029          0.00000
  C          1.21479         -0.70136          0.00000
  H          2.15666         -1.24515          0.00000
  C          1.21479          0.70136          0.00000
  H          2.15666          1.24515          0.00000
```

https://chemrxiv.org/

Source: http://calistry.org/calculate/xyzviewer

Roadmap for ChemRxiv

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- Key Items for 2018:
  - Integration of iThenticate software to auto-run and deposit report to Publishing Manager dashboard
  - Inclusion of best fit categorization for chemistry
  - One-click transfer to/from journal submission sites
  - Continued evaluation and pass-through of information collected
  - Community development: specific sub-disciplines of chemistry
  - Data, metadata development opportunities

Geographic diversity of users growing

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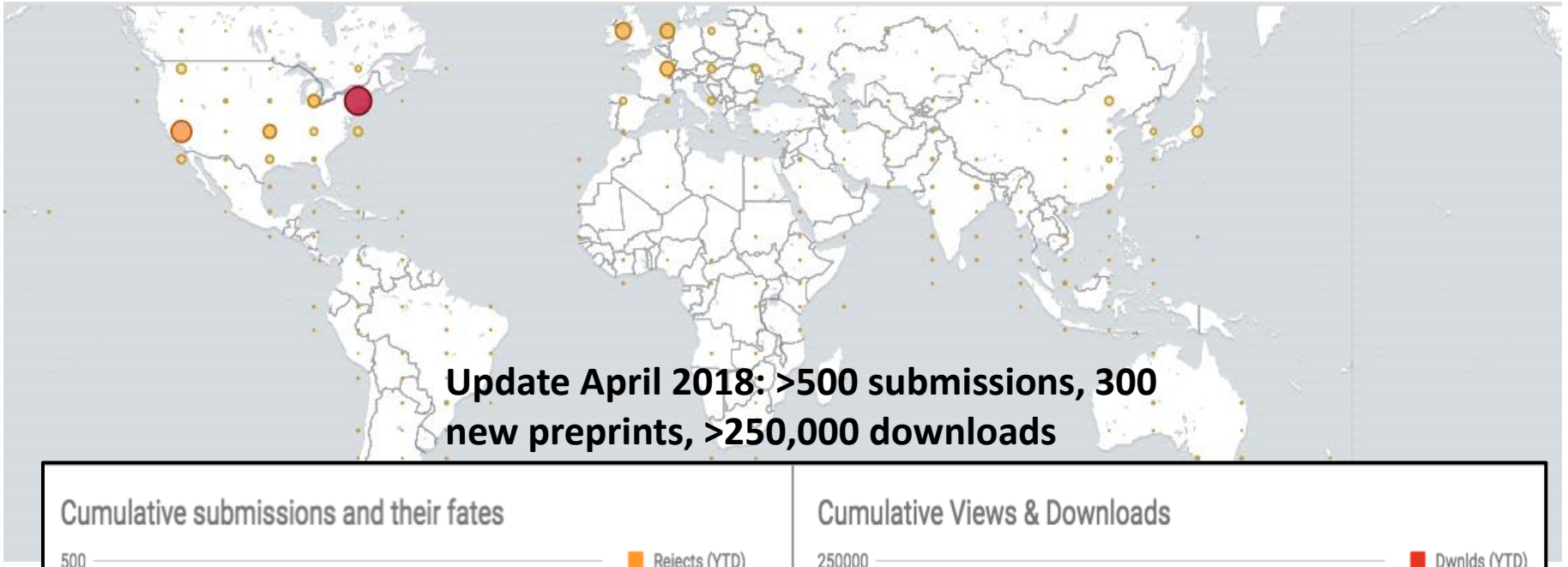
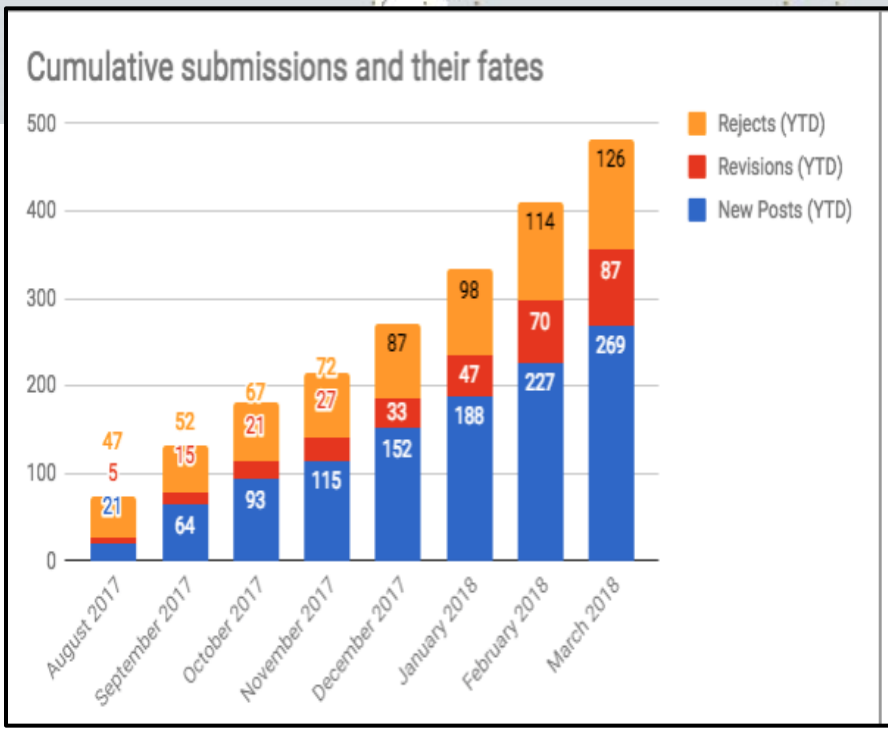
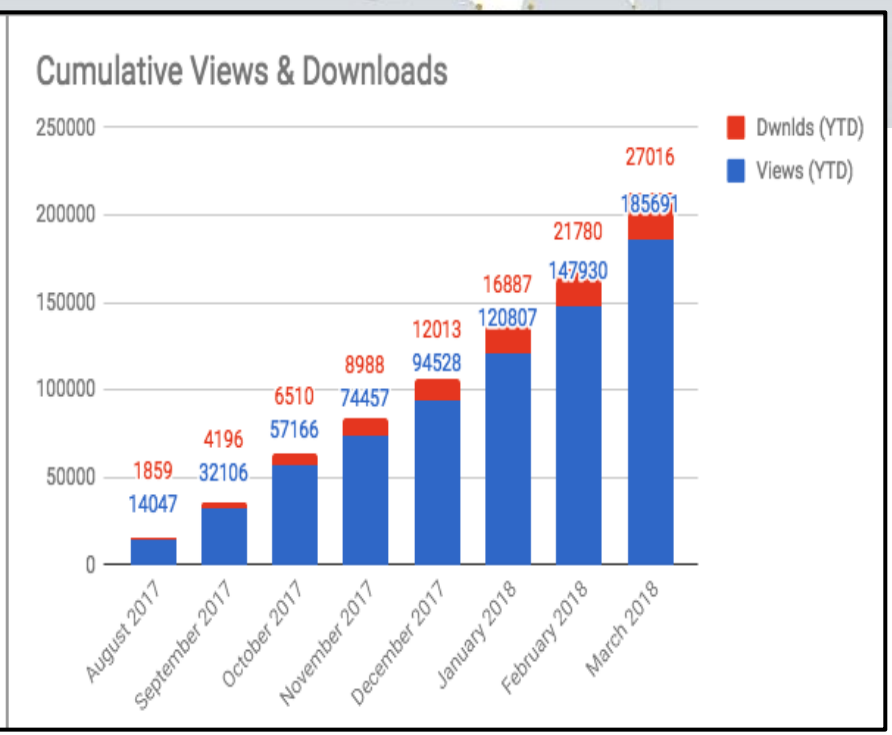


Update April 2018: >500 submissions, 300 new preprints, >250,000 downloads





How can preprint servers be a successful, sustainable piece of the scholarly communication cycle?

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- ***Successful*** →
  - partner, collaborate
  - engage broadly
  - care about preservation, integrity, leading to greater trust and growing adoption
  - address ethics (COPE)

- ***Sustainable*** →
  - explore new technology solutions
  - audit processes
  - automation, AI in future

- ***Part of the Communication Cycle*** → "do what needs to be done at the right time"
  - involve experts in the communication cycle, look ahead to future opportunities
  - bring existing resources and best practices from publishing where appropriate
  - integrate depositions to/from preprint servers/journals, seek efficiencies for all

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