Bioimage analysis for Research Data Management

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Microscopy data size, quantity, and acquisition techniques are growing at remarkable rates. At the same time, research data management (RDM) practices lag behind: data is stored on personal computers and external hard drives, data is sparsely annotated and experimental metadata is often not linked. In addition, the specificity of research fields hampers the search for standards. In response, multiple initiatives have emerged. Ours, named I3D:bio [1] (Information Infrastructure for BioImage Data), aims to facilitate the deployment of OMERO [2] servers, the most popular solution for the management of microscopy images [3]. Thus, our purpose is to generalize the availability of OMERO so to expose more researchers to OMERO, while producing clear RDM guidelines and user documentation for integrating analysis software. These will help users to connect many popular image analysis tools (ImageJ, CellProfiler, napari, ilastik, QuPath) with their OMERO servers, demonstrating the usefulness of annotated data. Our goal is therefore to promote OMERO as an endpoint for image analysis and encourage more image analysis tools to interoperate with OMERO. By proposing more workflows around OMERO, we hope to obtain a faster adoption of RDM by researchers.

[1] https://www.i3dbio.de

[2] Allan, C., Burel, JM., Moore, J. et al. OMERO: flexible, model-driven data management for experimental biology. NatMethods 9, 245–253 (2012). https://doi.org/10.1038/nmeth.1896

[3] Schmidt C., Hanne J., Moore J. et al. Research data management for bioimaging: the 2021 NFDI4BIOIMAGE community survey. F1000Research 11:638 (2022). https://doi.org/10.12688/f1000research.121714.2

I3D:bio Image Data Workflow
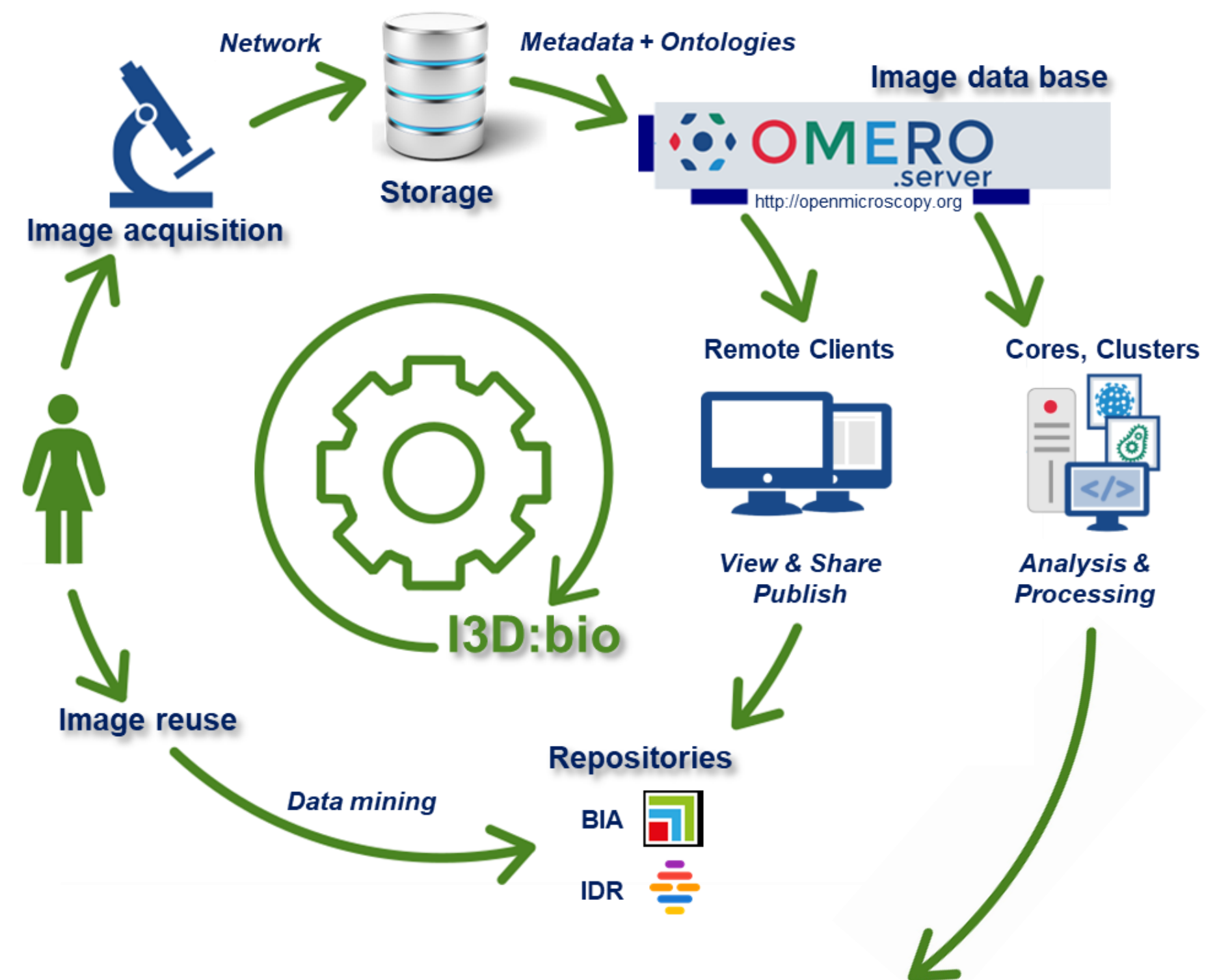
OMERO FOR I/O
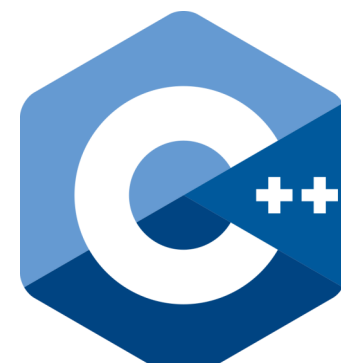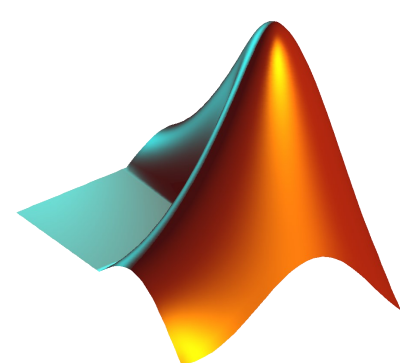
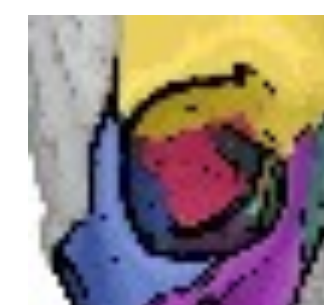**TheJacksonLaboratory/ezomero (poster 31)**   **GReD-Clermont/omero_macro-extensions**

NAPARI   OMERO-WND-CHARM   MICROSCOPY IMAGE BROWSER   FLIMfit   ORBIT IMAGE ANALYSIS   JIPipe
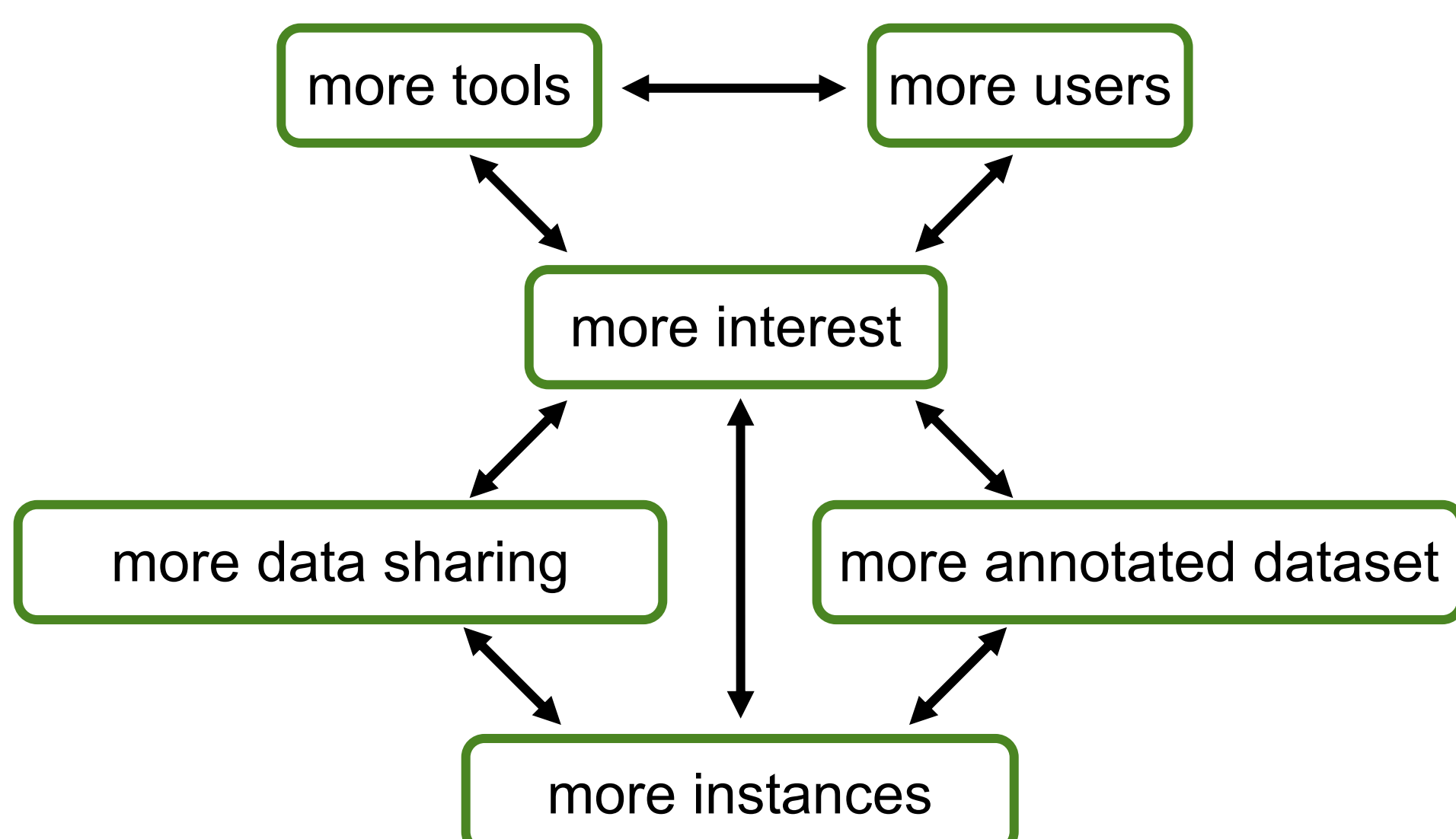
KNIME   CELLPROFILER   ILASTIK   QPATH   INSERT YOUR SOFTWARE HERE

PROMOTE RDM

more tools ↔ more users
more interest
more data sharing   more annotated dataset
more instances

→ Better research

INCREASE YOUR IMPACT

Target the wider OMERO community:

- Submit pull requests to existing projects:
  - Solve GitHub issues
  - Extend API and their wrappers
  - Add OMERO I/O to your favorite analysis software

- Document the usage of your software with OMERO

- Encapsulate your analysis as a Python script for OMERO