

## MS25-P10 | MICROED, FAST AND FURIOUS

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Small molecule electron diffraction may be as old as electron microscopes, but made its popular debut only last year, thanks to teams from PSI [1] and UCLA-Caltech [2]. The new method, called microED, allows researchers to perform crystallographic analysis at the atomic level from simple powders composed of only nanocrystals – and much quicker than ever before. MicroED gives researchers the opportunity to characterize newly synthesized compounds “on the fly,” meaning they can gather important details about a sample throughout its creation, potentially guiding the chemical development process. For the first time ever, a team lead by Tim Gruene at the Paul Scherrer Institut was able to show the power of this technique using a commercially-available capsule of a painkiller. Using MicroED, they were able to separate out and characterize one single crystal of the main active ingredient, paracetamol. This technique isn't just limited to small molecules; peptide samples that were previously considered too unstructured to crystallize can now be analyzed as well [3].

Moving forward, this method, using cryo-EM instrumentation already at our fingertips, will provide structural insight at unparalleled speeds and with higher resolution images. We have created a workflow to make microED fast and easy, and easily accessible to all users. This workflow does also support macromolecular MicroED.

[1] Tim Gruene et al., *Angew. Chem. Int. Ed.* 2018, 57, 1 – 6

[2] CG. Jones, Tamir Gonen et al,

[https://chemrxiv.org/articles/The\\_CryoEM\\_Method\\_MicroED\\_as\\_a\\_Powerful\\_Tool\\_for\\_Small\\_Molecule\\_Structure\\_Determination/7215332](https://chemrxiv.org/articles/The_CryoEM_Method_MicroED_as_a_Powerful_Tool_for_Small_Molecule_Structure_Determination/7215332)

[3] Shi et al. *eLife* 2013;2:e01345, [https://cryoem.ucla.edu/uploads/image/pdfs/2013\\_shi.pdf](https://cryoem.ucla.edu/uploads/image/pdfs/2013_shi.pdf)