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Improved understanding of drug mechanism-of-action by establishing a nation-wide service of morphological profiling





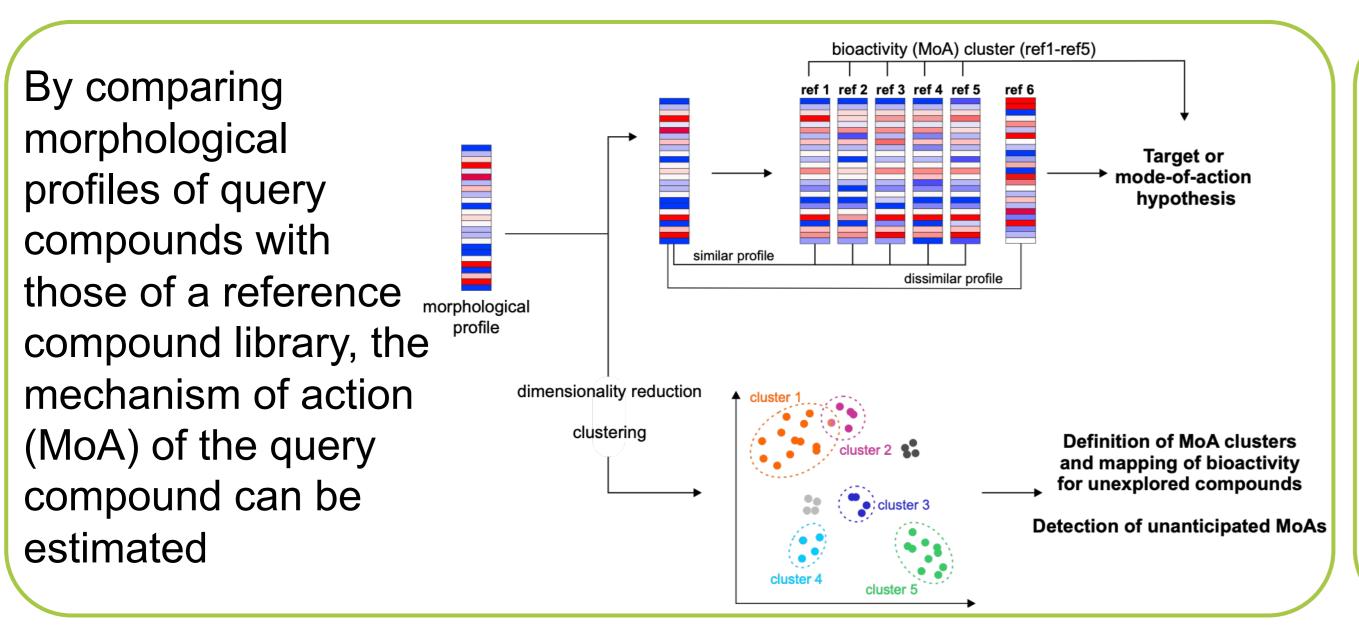
Untargeted morphological profiling

ER (Concanavalin A) Nucleus Nucleoli, cytoplasmic RNA Mitochondrion Cytoplasmic RNA (Hoechst 33342) (SYTO 14) Golgi apparatus Healthy and High-throughput staining and imaging: diseased patient e.g. Cell Painting assay cell lines **Features** Morphological profiles Mitochondria (Mitotracker) F-actin cytoskeleton, Golgi, plasma membrane Image analysis and Downstream analysis: feature extraction mapping relationships (Phalloidin+WGA)

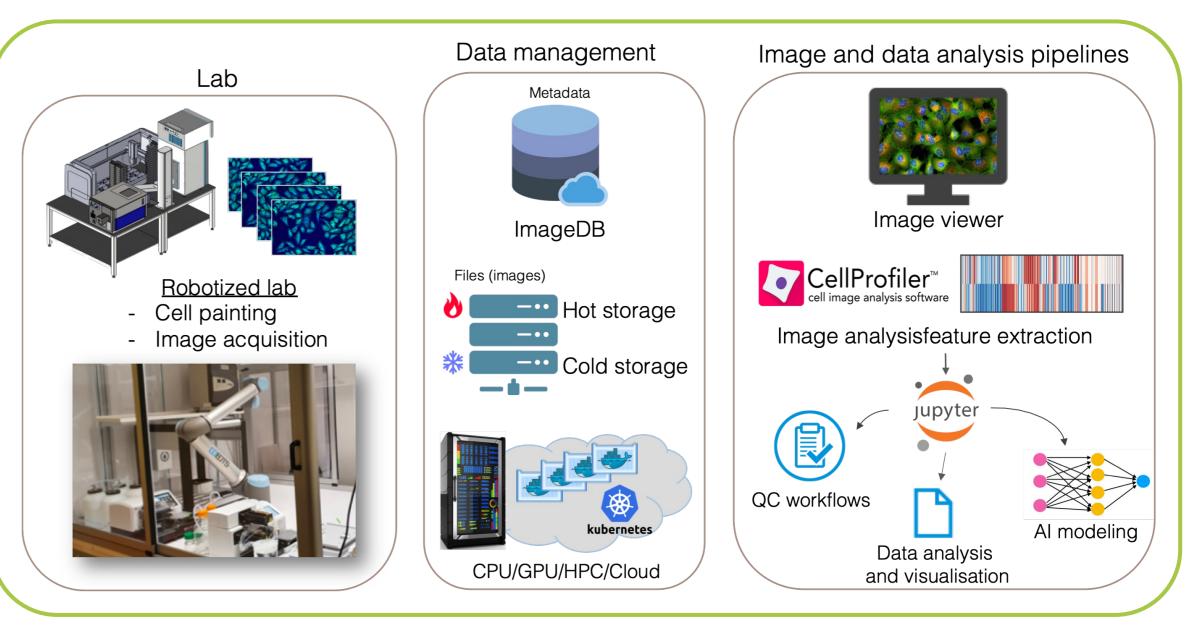
Cell Painting

The technique includes a cocktail of fluorescent reagents to stain 8 different organelles (nucleus, nucleoli, cytoplasmic RNA, f-actin cytoskeleton, Golgi, ER, mitochondria and plasma membrane. High content imaging and image analysis are used to extract cellular features, which are then used for morphological profiling

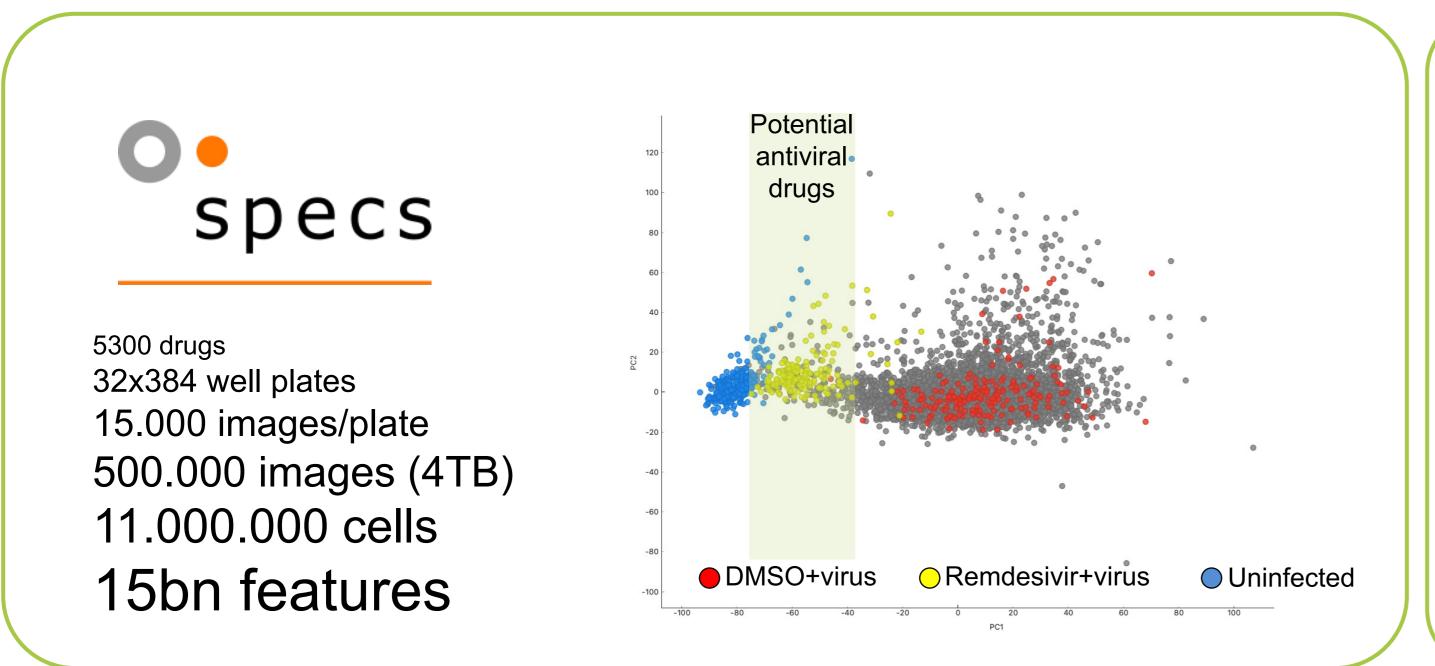
MoA identification



Infrastructure



Antiviral repurposing screen against SARS-CoV-2



Future

- Cell painting on primary cell models
 - Ovarian cancer
 - Fibroblasts
- Generation of reference data sets (SPECS and JUMP)
- Develop a userfriendly web portal for data reporting

Team



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Jordi Carreras-Puigvert Node head

SciLifeLab has been created by the coordinated effort of four universities in Stockholm and Uppsala: Stockholm University, the Karolinska Institutet, KTH Royal Institute of Technology and Uppsala University.

References: • Bray MA et al. Nat Prot. 2016 • Chandrasekaran NS et al. Nat Rev 2020 Caicedo J et al. Nat Methods 2017 Corsello SM et al. Nat Med 2017

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