

Cryo-electron tomography on FIB-lamellae for the structural characterization of bacterial secretion systems

Citation for published version (APA):

Berger, C. (2022). *Cryo-electron tomography on FIB-lamellae for the structural characterization of bacterial secretion systems*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20221101cb>

Document status and date:

Published: 01/01/2022

DOI:

[10.26481/dis.20221101cb](https://doi.org/10.26481/dis.20221101cb)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

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Propositions

1. The type III and VII secretion systems are excellent targets for drug development, because of their importance in pathogenesis and the (likely) presence of readily accessible extracellular domains
2. One of the current limitations of cryo-electron tomography on FIB lamellae is its relatively low throughput. Since the speed of the whole workflow is limited by the speed and success rate of each individual step, each step must be optimised (*Chapter 2*)
3. The pursuit of high-resolution structures creates the risk of ignoring more heterogenous structural states, which may biologically be highly relevant (*Chapter 5*)
4. The nature of cellular tomography allows for a wide range of biological structures to be observed in a given dataset. Scientific collaboration with experts in their respective biological fields can help to use this data to its fullest potential (*Chapter 6*)
5. To study the structural landscape of macromolecules has become more urgent with the rise in AI structure prediction methods, which rely on experimentally-obtained data for training
6. The future of structural biology is *in situ*
7. Scientific collaboration is more productive than competition
8. High-income countries have a moral responsibility to develop effective treatments against tuberculosis, which affects millions of people, predominantly in low and middle-income countries

Casper Berger, 1 November 2022