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Review of the Doctoral Dissertation of **Agnieszka Łątka**, titled:
 “Characterization and in vitro engineering of exopolysaccharide
 (EPS) depolymerases originated from *Klebsiella* phages”

April 2019

To Whom It May Concern,

I very much enjoyed reading the dissertation of Agnieszka Łątka. Please find my comments below:

1. Major comments:

- Chapter 1 (literature review)

Surprisingly, all the intricate events between phage attachment/entry and lysis/release, seem to be summarized by a single sentence "Phage DNA overtakes the control over bacterial molecular machinery leading to replication of phage genome together with expression of phage proteins" (page 26). I think the literature review should deal with this issue a bit more insightful.

The full impact of enforced capsule depolymerization on *Klebsiella* virulence is not completely clear to me. Perhaps because the pathogenicity of *Klebsiella* itself is not really documented in the literature review. While it is well-described how *Klebsiella* evades the immune system, it is unclear from the review how it actually is harmful to the host. Perhaps the candidate can more clearly highlight this in the text.

- Chapter 4:

Although an interesting *in silico* analysis is provided, I wonder to which extent solid conclusions would still need structural validation. Perhaps the candidate can comment more extensively on this point.

- Chapter 5:

This chapter is quite spectacular in terms of implemented methodology and achieving proof of concept, but I would perhaps have expected to see this proof of efficient host-swapping expressed more quantitatively (vs. the rather qualitative comparison in Fig. 5.10). After all, aside capsule composition, the used *Klebsiella* hosts might differ in other physiological

aspects as well, which in turn could more subtly affect infection dynamics. The candidate could reflect on this in the corresponding discussion.

2. Minor comments:

- Chapter 3:

Given the apparent contributions from or data-sharing with Majkowska-Skrobek et al., the candidate should perhaps more clearly delineate her exact contributions to this chapter.

3. The evaluation of the presentation (layout, style, structure)

Layout, style and structure of the dissertation was very clear, no additional comments.

Conclusion

After detailed revision of the doctoral dissertation of Agnieszka Łątka, I believe that the dissertation meets the originality and independence conditions set out in the Act of 14.03.2003 on academic degrees and academic title (Journal of Laws No. 65, item 595, article 13.1). I recommend the Council of the Faculty of Biological Sciences of the University of Wrocław to allow Agnieszka Łątka to the further stages of the doctoral procedure.

Sincerely,

Abram Aertsen

