Chapter 3

General

Active transport

Stasi, R., Neves, H. I. & Spira, B. (2019). Phosphate uptake by the phosphonate transport system PhnCDE. *BMC Microbiology* **19**(1), 79. https://doi.org/10.1186/s12866-019-1445-3

Vuppada, R. K., *et al*. (2018). Phosphate signaling through alternate conformations of the PstSCAB phosphate transporter. *BMC Microbiology* **18**(1), 8. https://doi.org/10.1186/s12866-017-1126-z

ATP-binding cassette (ABC) pathway

Delepelaire, P. (2019). Bacterial ABC transporters of iron containing compounds. *Research in Microbiology* **170**(8), 345-357. https://doi.org/10.1016/j.resmic.2019.10.008

Mächtel, R., *et al*. (2019). An integrated transport mechanism of the maltose ABC importer. *Research in Microbiology* **170**(8), 321-337. https://doi.org/10.1016/j.resmic.2019.09.004

Tripartite ATP-independent periplasmic (TRAP) transporters

Schäfer, L., *et al*. (2019). A tripartite tricarboxylate transporter (MIM_c39170–MIM_c39210) of *Advenella mimigardefordensis* DPN7T is involved in citrate uptake. *International Microbiology* **22**(4), 461-470. https://doi.org/10.1007/s10123-019-00073-5

Group translocation

Iron uptake and siderophores

Delepelaire, P. (2019). Bacterial ABC transporters of iron containing compounds. *Research in Microbiology* **170**(8), 345-357. https://doi.org/10.1016/j.resmic.2019.10.008

Smith, A. T., *et al*. (2019). The FeoC [4Fe–4S] cluster is redox-active and rapidly oxygen-sensitive. *Biochemistry* **58**(49), 4935-4949. https://doi.org/10.1021/acs.biochem.9b00745

TonB-dependent active transport across the outer membrane in Gram-negative bacteria

Multidrug efflux pump

Orelle, C., Mathieu, K. & Jault, J.-M. (2019). Multidrug ABC transporters in bacteria. *Research in Microbiology* **170**(8), 381-391. https://doi.org/10.1016/j.resmic.2019.06.001

Severi, E. & Thomas, G. H. (2019). Antibiotic export: transporters involved in the final step of natural product production. *Microbiology* **165**(8), 805-818. https://doi.org/10.1099/mic.0.000794

Protein translocation

General secretion pathway (GSP)

Twin-arginine translocation (TAT) pathway

Dolata, K. M., *et al*. (2019). Far-reaching cellular consequences of *tat* deletion in *Escherichia coli* revealed by comprehensive proteome analyses. *Microbiological Research* **218**, 97-107. https://doi.org/10.1016/j.micres.2018.10.008

Ryu, J., *et al*. (2019). Tat-dependent heterologous secretion of recombinant tyrosinase by *Pseudomonas fluorescens* is aided by a translationally fused caddie protein. *Applied and Environmental Microbiology* **85**(20), e01350-01319. https://aem.asm.org/content/aem/85/20/e01350-19.full.pdf

Valverde, J. R., Gullón, S. & Mellado, R. P. (2018). Modelling the metabolism of protein secretion through the Tat route in *Streptomyces lividans*. *BMC Microbiology* **18**(1), 59. https://doi.org/10.1186/s12866-018-1199-3

Protein translocation through the ABC pathway

Beis, K. & Rebuffat, S. (2019). Multifaceted ABC transporters associated to microcin and bacteriocin export. *Research in Microbiology* **170**(8), 399-406. https://doi.org/10.1016/j.resmic.2019.07.002

Geise, H., *et al*. (2019). A potential late stage intermediate of twin-arginine dependent protein translocation in *Escherichia coli*. *Frontiers in Microbiology* **10**, 1482. https://www.frontiersin.org/article/10.3389/fmicb.2019.01482

Heinkel, F. et al. (2019). Phase separation and clustering of an ABC transporter in *Mycobacterium tuberculosis*. *Proceedings of the National Academy of Sciences of the USA* **116**(33), 16326-16331. https://www.pnas.org/content/pnas/116/33/16326.full.pdf

Slamti, L. & Lereclus, D. (2019). The oligopeptide ABC-importers are essential communication channels in Gram-positive bacteria. *Research in Microbiology* **170**(8), 338-344. https://doi.org/10.1016/j.resmic.2019.07.004

van Veen, H. W., *et al*. (2019). Energy coupling in ABC exporters. *Research in Microbiology* **170**(8), 392-398. https://doi.org/10.1016/j.resmic.2019.08.003

Protein translocation through the cell wall in Gram-positive bacteria

Protein translocation in Gram-negative bacteria

Allsopp, L. P., Bernal, P., Nolan, L. M. & Filloux, A. (in press). Causalities of war: The connection between T6SS and microbiota. *Cellular Microbiology*. https://onlinelibrary.wiley.com/doi/abs/10.1111/cmi.13153

Bayer-Santos, E., Ceseti, L. d. M., Farah, C. S. & Alvarez-Martinez, C. E. (2019). Distribution, function and regulation of type 6 secretion systems of *Xanthomonadales*. *Frontiers in Microbiology* **10**, 1635. https://www.frontiersin.org/article/10.3389/fmicb.2019.01635

Butan, C., *et al*. (2019). High-resolution view of the type III secretion export apparatus in situ reveals membrane remodeling and a secretion pathway. *Proceedings of the National Academy of Sciences of the USA* **116**(49), 24786-24795. https://www.pnas.org/content/pnas/116/49/24786.full.pdf

Chen, C., Yang, X. & Shen, X. (2019). Confirmed and potential roles of bacterial T6SSs in the intestinal ecosystem. *Frontiers in Microbiology* **10**, 1484. https://www.frontiersin.org/article/10.3389/fmicb.2019.01484

Kirchweger, P., *et al*. (2019). Structural and functional characterization of SiiA, an auxiliary protein from the SPI4-encoded type 1 secretion system from *Salmonella enterica*. *Molecular Microbiology* **112**(5), 1403-1422. https://onlinelibrary.wiley.com/doi/abs/10.1111/mmi.14368

Liang, X., *et al* (2019). An onboard checking mechanism ensures effector delivery of the type VI secretion system in *Vibrio cholerae*. *Proceedings of the National Academy of Sciences of the USA* **116**(46): 23292-23298. https://www.pnas.org/content/pnas/116/46/23292.full.pdf

Liaw, J., *et al*. (2019). The Campylobacter jejuni type VI secretion system enhances the oxidative stress response and host colonization. *Frontiers in Microbiology* **10**, 2864. https://www.frontiersin.org/article/10.3389/fmicb.2019.02864

Palmer, A. D., Kim, K. & Slauch, J. M. (2019). PhoP-mediated repression of the SPI1 type 3 secretion System in *Salmonella enterica* serovar Typhimurium. *Journal of Bacteriology* **201**(16), e00264-00219. https://jb.asm.org/content/jb/201/16/e00264-19.full.pdf

Peñil-Celis, A. & Garcillán-Barcia, M. P. (2019). Crosstalk between type VI secretion system and mobile genetic elements. *Frontiers in Molecular Biosciences* **6**, 126. https://www.frontiersin.org/article/10.3389/fmolb.2019.00126

Sharp, J. S., Rietsch, A. & Dove, S. L. (2019). RNase E promotes expression of type III secretion system genes in *Pseudomonas aeruginosa*. *Journal of Bacteriology* **201**(22), e00336-00319. https://jb.asm.org/content/jb/201/22/e00336-19.full.pdf

Stietz, M. S., et al. (2019). Double tubular contractile structure of the type VI secretion system displays striking flexibility and elasticity. *Journal of Bacteriology* **202**(1), e00425-00419. https://jb.asm.org/content/jb/202/1/e00425-19.full.pdf

Xie, Y., Shao, X. & Deng, X. (2019). Regulation of type III secretion system in *Pseudomonas syringae*. *Environmental Microbiology* **21**(12), 4465-4477. https://sfamjournals.onlinelibrary.wiley.com/doi/abs/10.1111/1462-2920.14779

Type VII secretion system

Famelis, N., *et al*. (2019). Architecture of the mycobacterial type VII secretion system. *Nature* **576**(7786), 321-325. https://doi.org/10.1038/s41586-019-1633-1

Export of polysaccharides and components of surface structures

Hughes, G. W., *et al*. (2019). Evidence for phospholipid export from the bacterial inner membrane by the Mla ABC transport system. *Nature Microbiology* **4**(10), 1692-1705. https://doi.org/10.1038/s41564-019-0481-y

Sperandeo, P., Martorana, A. M. & Polissi, A. (2019). The Lpt ABC transporter for lipopolysaccharide export to the cell surface. *Research in Microbiology* **170**(8), 366-373. https://doi.org/10.1016/j.resmic.2019.07.005

Protein secretion in Archaea

Metallochaperones

Antoine, R., Rivera-Millot, A., Roy, G. & Jacob-Dubuisson, F. (2019). Relationships between copper-related proteomes and lifestyles in β proteobacteria. *Frontiers in Microbiology* **10**, 2217. https://www.frontiersin.org/article/10.3389/fmicb.2019.02217

Christenson, E. T., *et al*. (2019). The iron-regulated vacuolar *Legionella pneumophila* MavN protein is a transition-metal transporter. *Proceedings of the National Academy of Sciences of the USA* **116**(36), 17775-17785.