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Metagenomic sequencing in clinical virology: advances in pathogen detection and future prospects

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Citation

Carbo, E. C. (2023, May 17). *Metagenomic sequencing in clinical virology: advances in pathogen detection and future prospects*. Retrieved from <https://hdl.handle.net/1887/3618319>

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METAGENOMIC SEQUENCING IN CLINICAL VIROLOGY

ADVANCES IN PATHOGEN DETECTION AND FUTURE PROSPECTS

1. The use of viral metagenomics as a diagnostic approach will allow identification of rare viral causes of disease that are easily omitted by current diagnostic workflows. (*This thesis*)
2. With the rising risk of novel or zoonotic emerging viruses, it is essential that every microbiological molecular diagnostic laboratory can perform metagenomic tests. (*This thesis*)
3. Metagenomic sequencing will greatly improve if test accuracy is increased by overcoming background DNA noise challenges, and if turn-around time is shortened by real-time sequencing. (*This thesis*)
4. Untargeted shotgun metagenomic sequencing can be utilized as a shared clinical application amongst microbiology, genetics, pathology and pharmacology departments. (*This thesis*)
5. 'The routine laboratory today currently fails to detect as much as 33 to 89% of respiratory pathogens, 40% of gastroenteritis, and 60% of all encephalitis cases, which impede the surveillance of diseases.' Kumeren N. Govender. *J Clin Microbiol* 2021; 59:e02146-20.
6. Investing in novel diagnostics should not only be assessed within one department but should include patient outcome and cost-effectiveness for the entire healthcare supply chain.
7. Rapid molecular epidemiology of SARS-CoV-2 was of decisive importance during the pandemic, therefore this kind of surveillance should be set up for all other microbial pathogens to aid epidemiological inferences of the relevant diseases.
8. 'Once the diversity of the microbial world is catalogued, it will make astronomy look like a pitiful science.' Julian Davis, cited by Virginia Gewin, *Nature* 2006; 439:384-6.
9. 'The book of Nature is written in the language of mathematics.' Galileo Galilei, in: *The Assayer (Il Saggiatore)*, 1623.
10. You can ride out bad things while riding out mountain bike trails.
11. Sometimes we need a push from someone else to start again. Like Maxi Jazz of Faithless sang: 'In you the song which rights my wrongs, In you the fullness of living, The power to begin again' Maxi Jazz, singer of Faithless, from the song: We come 1, 2001.