

# Taking long-read sequencing into the classroom

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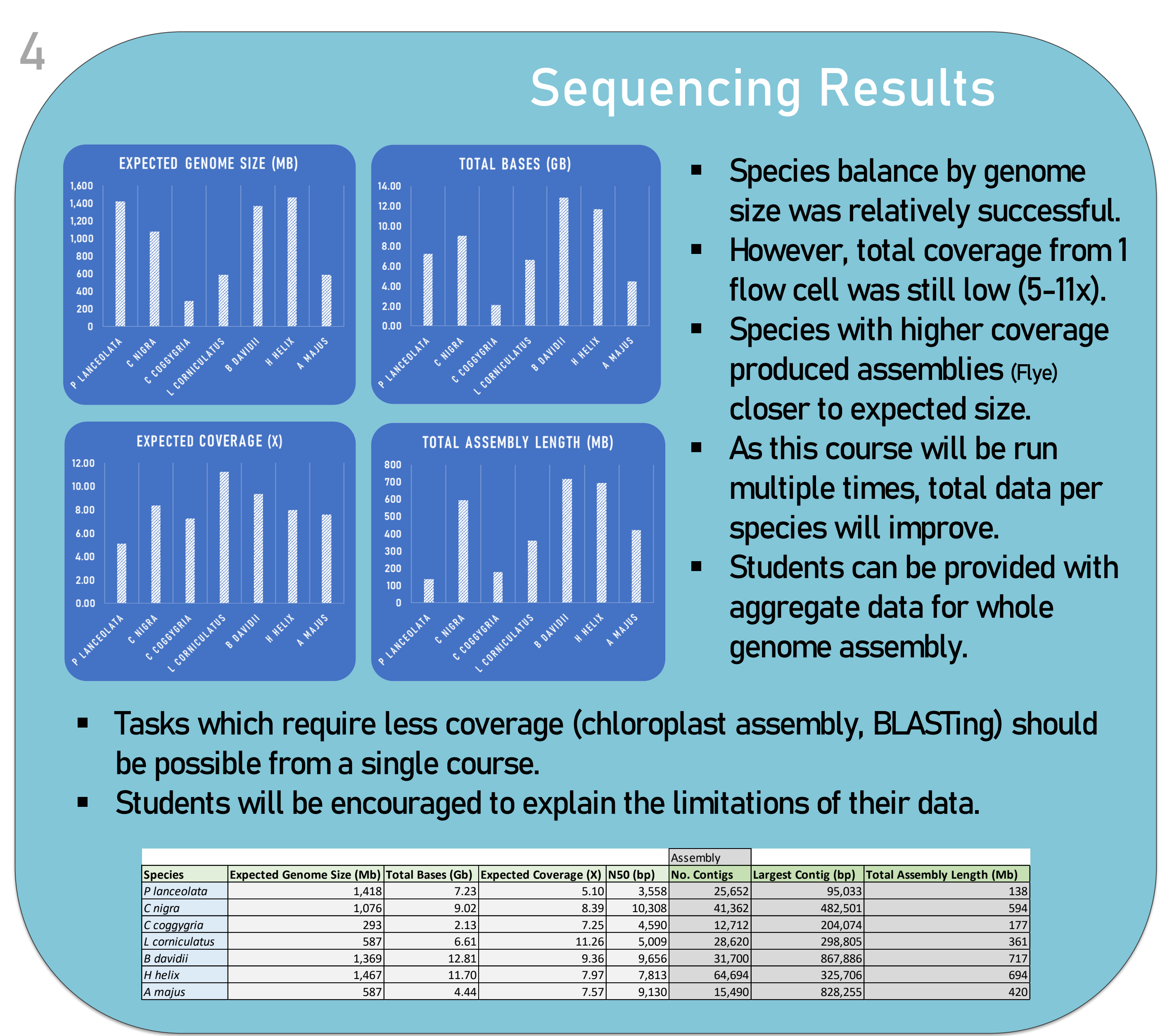
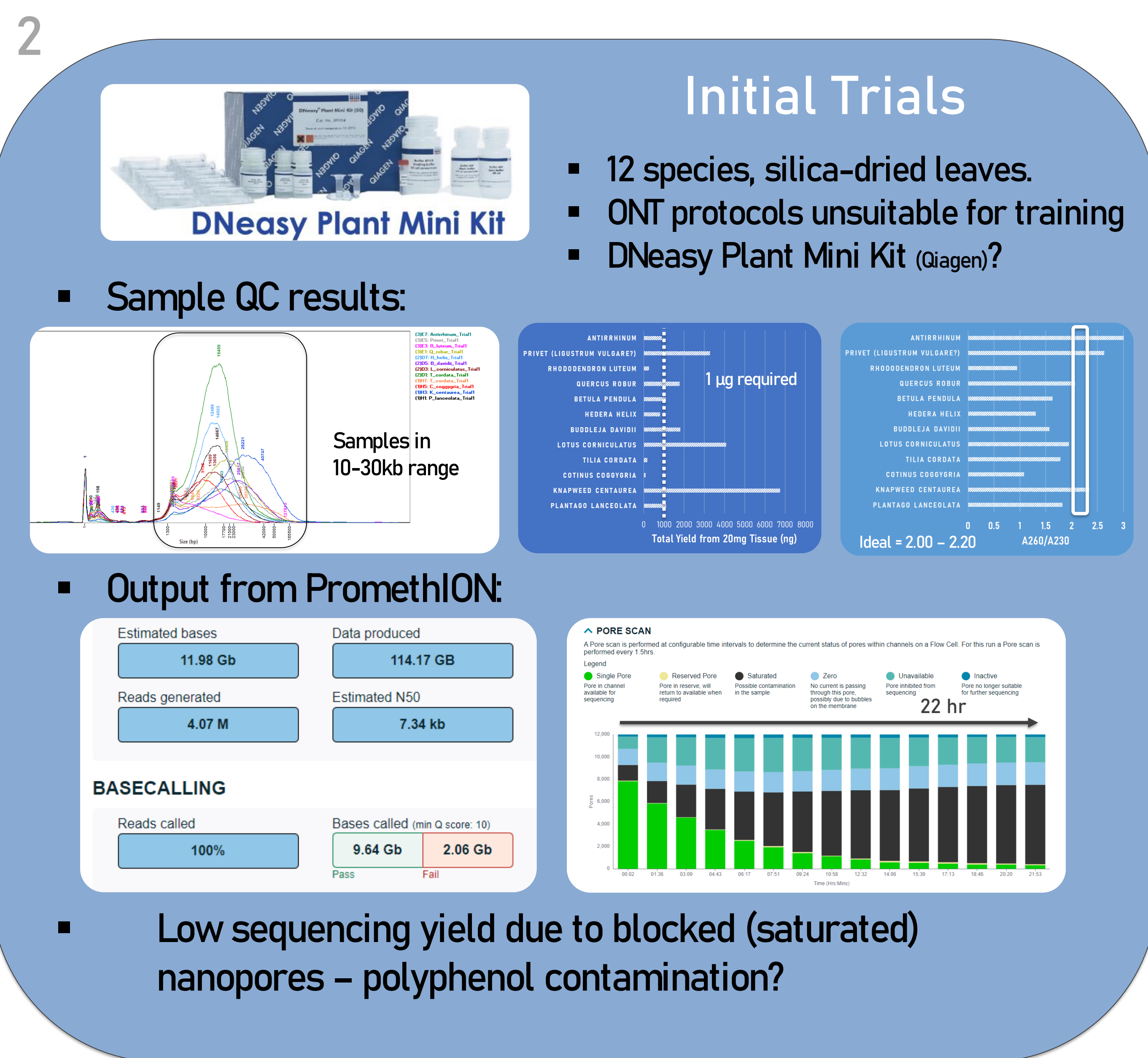
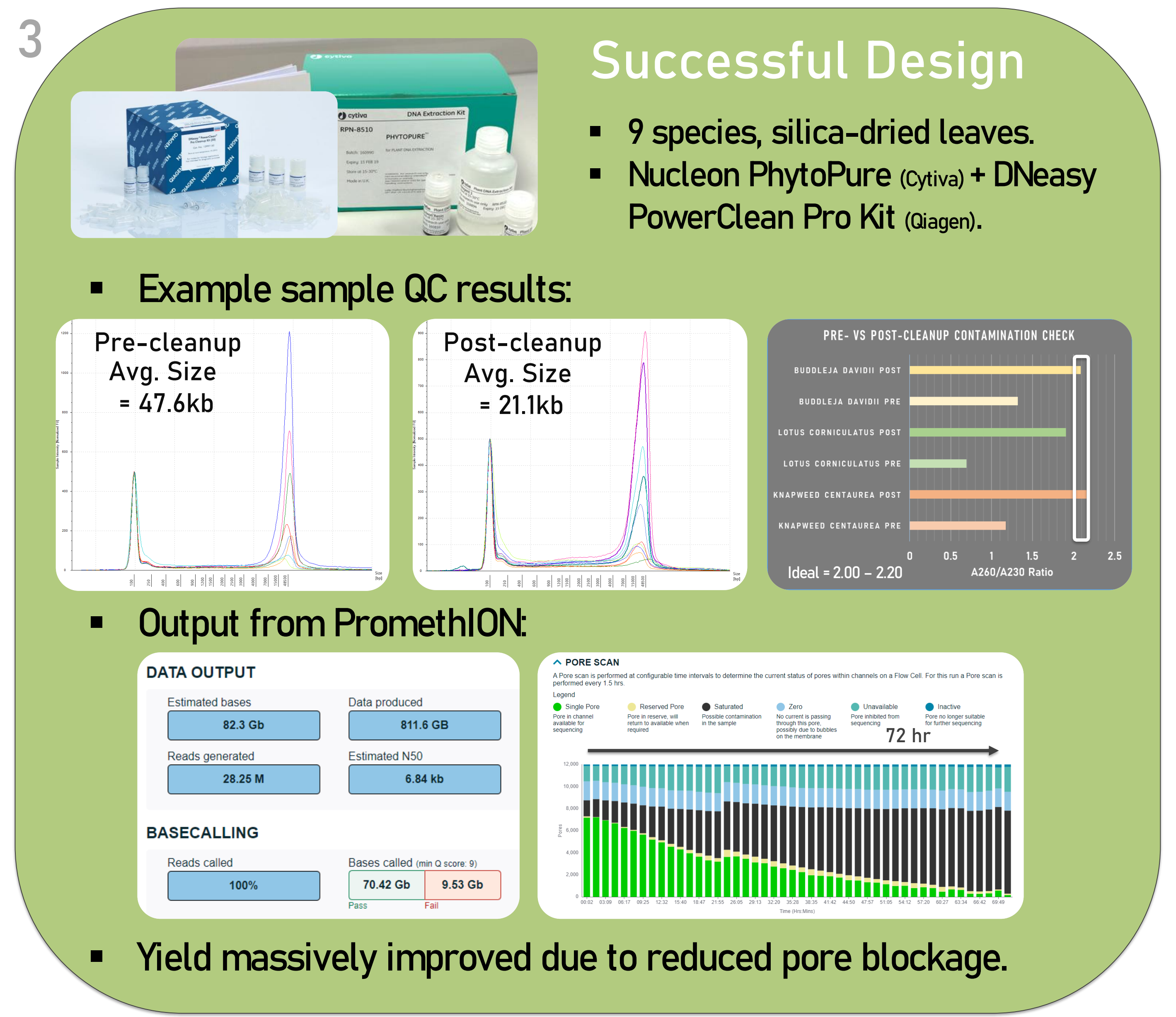
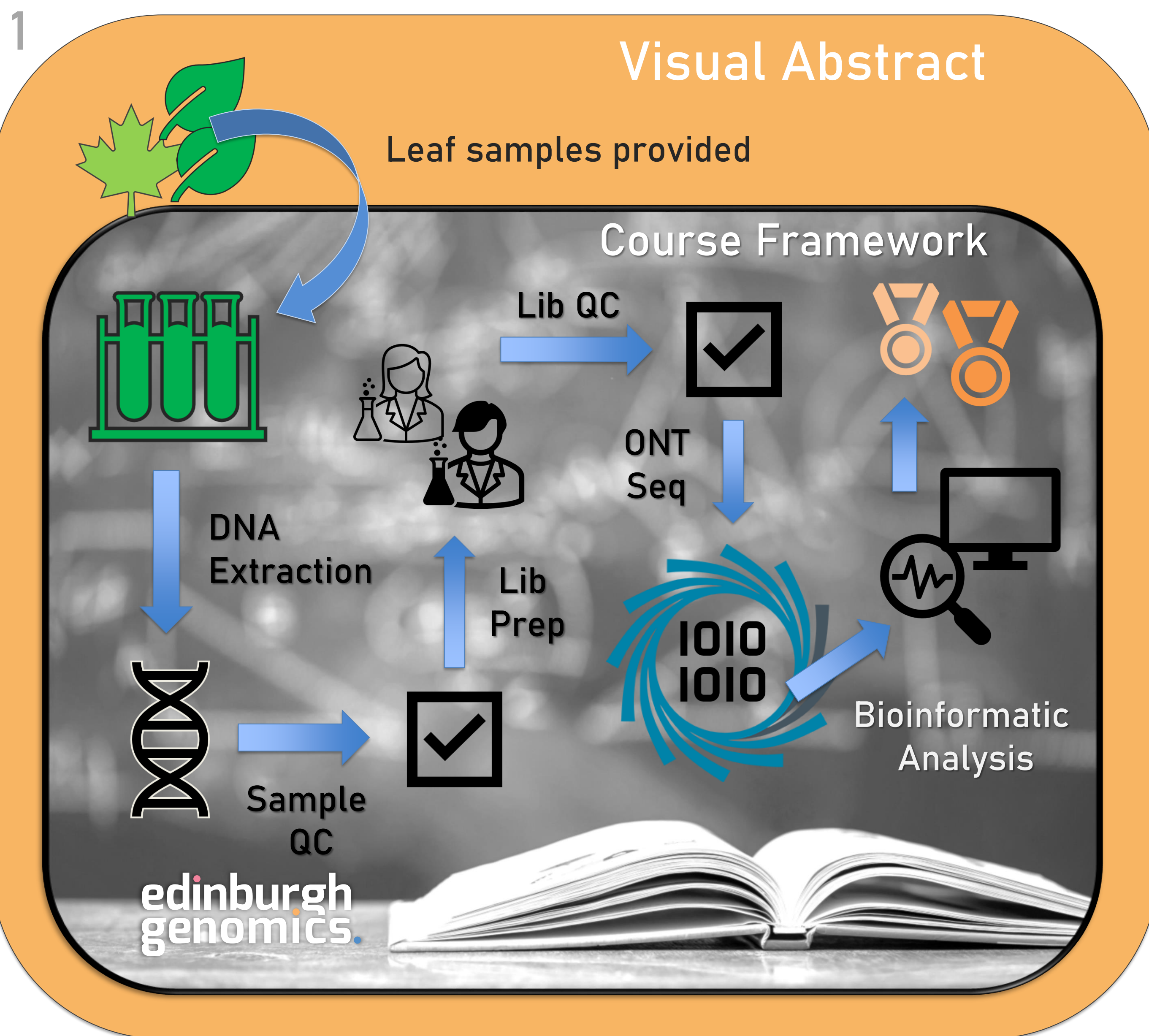
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## Abstract

Long-read sequencing, as exemplified by Oxford Nanopore and PacBio systems, is rapidly approaching the cost, yield and quality levels of short-read sequencing platforms. Within the next few years, these could become the dominant sequencing methodologies; however, teaching regarding sequencing at universities still largely revolves around short-read sequencing.

We wish to close that gap by developing a short course which will allow university students to get hands-on experience of long-read sequencing on real samples. This course will take advantage of recent protocol advancements which simplify and expedite the generation of long-read sequencing libraries. Students will be given tissue samples (leaves) of unknown origin and tasked with extracting the DNA, preparing their own barcoded sequencing libraries, loading the sequencer and analysing the resulting data to identify the species given. The species used will be changed for each iteration of the course. This puzzle aspect will make it interesting for the students, while also providing us with useful data for uncommon species.

In this poster, I discuss our trials with various DNA extraction kits, species, and library preparation protocols to come upon a suitable protocol for both teaching and generating acceptable data for analysis. When launched, this course will be an exciting hands-on introduction to long-read sequencing for our students and provide a framework for similar courses at other universities or institutes.



- ### Conclusions and Future Work
- Certain extraction methods are incompatible with nanopore sequencing.
  - The laboratory kits identified, plus the bioinformatics pipelines designed, provide a suitable basis for a training course aimed at Masters students.
  - Streamlined teaching materials (handbook + slides) will now be designed to guide students through the various kits and bioinformatic analyses. These will be made available online, open-access; following 'open science' principles.
  - The course will be run first as an NERC short course this Spring/Summer, prior to introduction at Masters level.