Alignment-free tools for metagenomics-data analysis

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Overview

Metagenomics

- A metagenome is the whole set of transcripts found in a sample.
- Metagenomics is the study of those
- $>$ 90% uncultureable microorganisms
- design of antibiotics, analysis of microorganismal life

NGS and Alignment

- Advances in sequencing made metagenomics possible
- NGS generates comparable reads

Metagenomics

Goals

- insight in microorganismal life
- first evidence of origin and function
- independent from databases and coding regions

Alignment-based approach

Advantages

- Align sequences against database
- Profiles can be analyzed
- BLAST $>$ 80% accuracy

Alignment-based approach

Advantages

- Align sequences against database
- Profiles can be analyzed
- BLAST $>$ 80% accuracy

Disadvantages

- Low speed
- Dependent of databases
- Unsequenced transcripts cannot be matched
- Databases mostly consist of coding sequences

Blocks of Highlighted Text

Block 1

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer lectus nisl, ultricies in feugiat rutrum, porttitor sit amet augue. Aliquam ut tortor mauris. Sed volutpat ante purus, quis accumsan dolor.

Block 2

Pellentesque sed tellus purus. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Vestibulum quis magna at risus dictum tempor eu vitae velit.

Block 3

Suspendisse tincidunt sagittis gravida. Curabitur condimentum, enim sed venenatis rutrum, ipsum neque consectetur orci, sed blandit justo nisi ac lacus.

Multiple Columns

Heading

1. Statement
2. Explanation
3. Example

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Table

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table: Table caption

Theorem

Theorem (Mass–energy equivalence)

$E = mc^2$

Verbatim

Example (Theorem Slide Code)

```
\begin{frame}
\frametitle{Theorem}
\begin{theorem}[Mass--energy equivalence]
$E = mc^2$
\end{theorem}
\end{frame}
```

Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

Citation

An example of the `\cite` command to cite within the presentation:

This statement requires citation [Smith, 2012].

References

John Smith (2012)

Title of the publication

Journal Name 12(3), 45 – 678.

The End