

3D Spatial Detection of DNA, RNA, and Proteins

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Categories:

- Biotechnology
- Chemistry and Chemical Analysis

Keywords:

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- DNA
- Proteins
- RNA

Researchers at Purdue University have developed a novel approach to spatially map the 3D position of DNA, RNA, and proteins. Prior to this invention, this key molecular information has been effectively limited to a 2D profile, with profile sections only 10-15 microns thick. The Purdue researchers' technique, named isolated fluorescent barcode imaging (IFBI), allows labeling and identification of all mRNA and proteins, some of which have previously been spatially too close to distinguish. This process is also much faster and less expensive compared to the traditional process, requiring only one round of labeling instead of multiple. Finally, this method can detect the intensity of the fluorophore labels along with the fluorophores themselves, providing 16,807 unique fluorescent barcodes, a probe pool large enough to map the entire human genome. This technology will contribute to advance studies with DNA, RNA, and proteins, allowing the detection of thousands of genes, mRNAs and proteins expressed within the same tissue sample.

Advantages:

- high throughput
- low cost
- 3D

Applications:

- 3D spatial detection of DNA, RNA, and proteins

People:

- Cui, Meng (Project leader)
- Cai, Dawen

Intellectual Property:

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