

Rainbow of Brain: 'Brainbow' the Multicolor Genetic Labeling and Analysis Tool

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GENETICS AND COLOR

Human brain has a highly detailed visual organization which is habituated in handling various information presented during an enormously intricate visual field during instantly changing stimuli. Due to this complexity VISION is perhaps considered the most prevailing sensory system in human body. The brain is able to understand such multifaceted quantifiable information projected through the visual exhibition.

This property is used in Visualization tools in the study of biological systems that are dynamic, such an embryo. The tissues that are developing or regenerating as the cells that are in the phase of differentiation, proliferation and dispersion.

This type of complex network system exists in our nervous system. There are thousands of neurons that forms millions of multifaceted networks and connections that actually intersect and tangle with each other contained in a trivial volume. It is a challenging task to analyse such a complex structure.

It requires a powerful approach for identification of one structure amongst numerous diverse distinct cellular components. Colour differentiation via the visual pathway is the most feasible modality technique for tracing the gene function and specific cell behaviour within this complex structures.¹

BRAIN BOW: DIGITAL SPECTRAL BARCODES FOR CELL TRACING

Brain bow produces colors in differential expression levels that denotes the levels of

several fluorescent proteins.² The brain bow technique is based on the fact that in our visual spectrum, the red, green, and blue are the primary colors, which syndicates to produce all the other colors.

Brain bow combines three or four distinct colored Fluorescent Proteins and articulating them in diverse ratios within each cell.

The subsequent color amalgamations are exclusive to each Brain bow-expressing cell. This assists as identification tags for the cells which will be envisioned through the usage of light microscope.¹

CURRENT APPLICATIONS OF BRAINBOW IMAGING TECHNIQUE

- Mapping neuronal connectivity
- Cellular dynamics and lineage tracing
- Genomic and genetic analyses¹

CONCLUSION

Brain bow imaging is considered as an increasingly valuable research tool, Brain bow-fluorescent labeling enabled the discovery of various exciting (and beautiful) genomic and genetic studies.

No wonder the Brain bow technique has evolved as versatile genetic paintbrushes in the world of imaging technology.

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