How to communicate cell behaviors visually

Cellarity is pioneering a new approach to drug discovery, treating disease at the level of the cell as opposed to a single molecular target.

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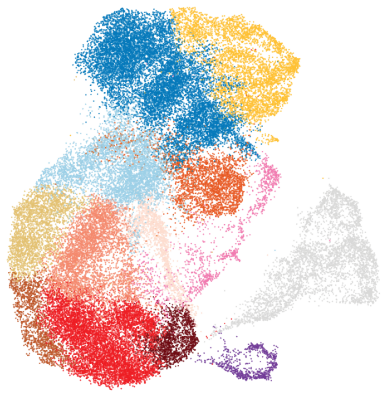
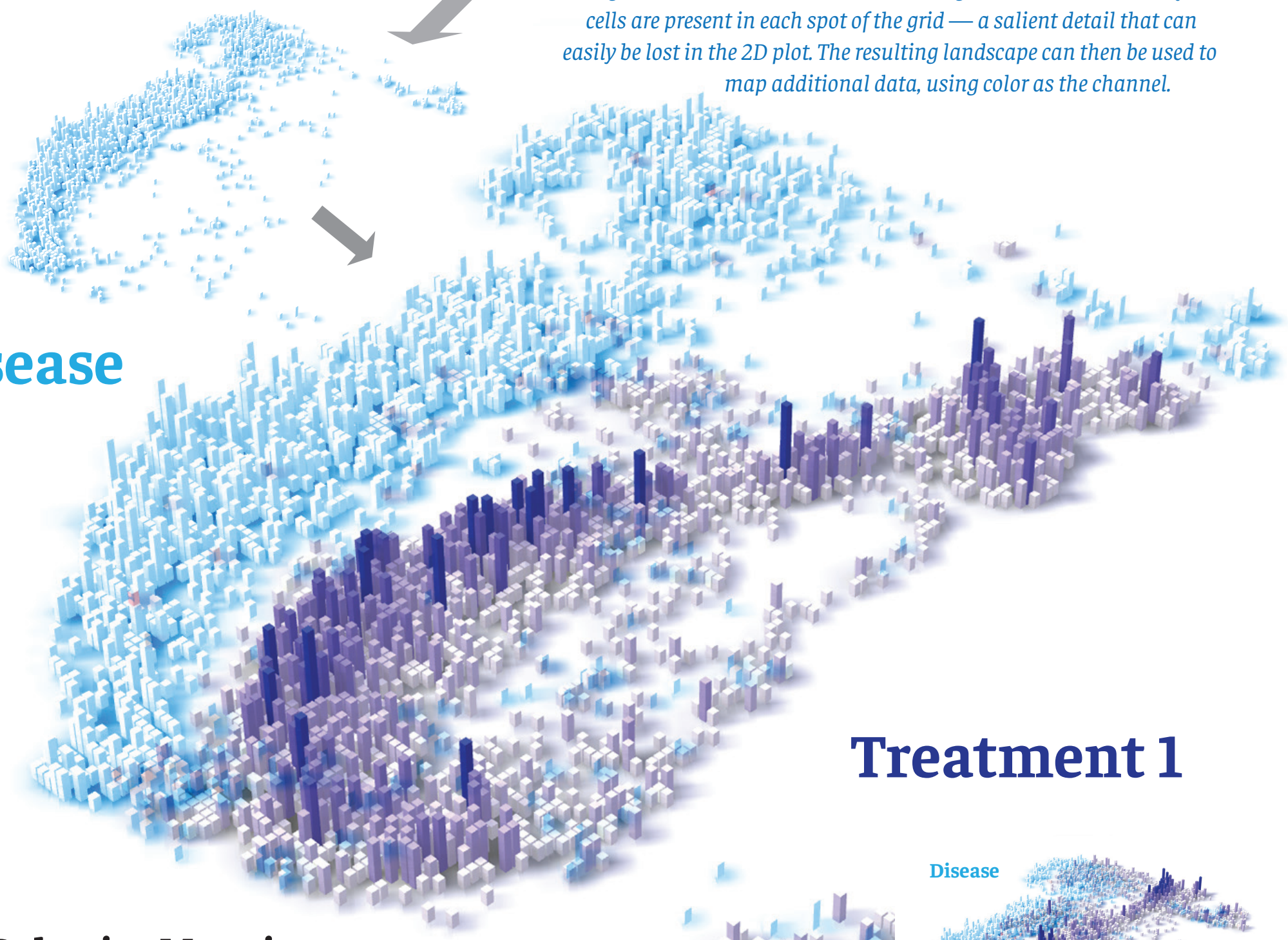
Cellarity

Combining unique expertise in network biology, high-resolution single-cell sequencing data, and machine learning, the result is a new understanding of the cell's trajectory from health to disease, and how cells relate to one another in tissues. The cell and its network of transcripts and proteins offer a more complete view of the complexity of human biology than any individual molecular target.



Starting point are UMAP plots, showing single-cell sequencing data from reference tissues. Cells with similar characteristics are close to each other, and opposing characteristics far apart. The single-cell data are then mapped onto a N x N grid. Then we draw bars, where the height illustrates how many cells are present in each spot of the grid — a salient detail that can easily be lost in the 2D plot. The resulting landscape can then be used to map additional data, using color as the channel.



Cell Behavior Mapping

Cellarity's platform first generates Cellarity Maps from both healthy and diseased human tissue. In this step we learn how cells navigate from health to disease by leveraging scientific hypothesis inspired by systems biology, high resolution single-cell data generated internally, and machine learning models of disease biology translated across human and animal models.

The map consists of:

- **City Landscape:** *Comprehensive view of all cell behaviors*
- **Neighborhood:** *Populations of cells with related behaviors*
- **Building:** *Population of individual cells with common behaviors*
- **Room:** *Individual cell defined by molecular network components*