**Highlights**

* Comprehensive analysis of 5-HT receptors across state-of-the-art single-cell mouse whole-brain transcriptomic atlases.
* Extensive co-transcription points at considerable complexity at the single cell level.
* Interactive visualizer provided for custom exploration at different levels of granularity.

**eTOC Blurb**

Serotonin (5-HT) plays a critical role in numerous physiological and pathological processes. De Filippo and Schmitz analyze two advanced transcriptomic atlases to map the transcription patterns of 5-HT receptors across millions of cells. Their findings reveal diverse transcription patterns of various 5-HT receptor genes. An interactive online tool is provided for custom data exploration, allowing quick, in-depth analysis across multiple grouping variables, facilitating a deeper understanding of 5-HT receptors and their implications for brain function and disorders.

**Bigger Picture**

Understanding the distribution and transcriptional complexity of 5-HT receptors is crucial for unraveling their roles in brain functions such as mood regulation, cognition, and sleep. This study leverages state-of-the-art single-cell RNA sequencing and spatial transcriptomics to map 5-HT receptor subtypes across millions of cells in the mouse brain. The findings highlight the extensive presence of these receptors, often co-transcribed within the same cell, pointing to the complexity of the serotonergic system even at the single-cell level. The provided interactive visualizer allows researchers to explore these data further, potentially leading to insights that could be translated across different domains of neuroscience and related fields. This work sets the stage for more targeted investigations into the functional implications of 5-HT receptor distributions, with potential impacts on understanding and treating psychiatric and neurological disorders.