SBGAT-BOT Space Biology Graphical Abstract Tool Bot

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The Space Biology Graphical Abstract Tool Bot (SBGAT-BOT) is a customizable Python tool that creates graphical representations of NASA's biological experiments. It features a user-friendly interface (UI) that generates outputs suitable for NASA's public-facing websites, including the Open Science Data Repository (OSDR). Users can display or modify graphical outputs through iterative UI interactions. These graphical representations are essential for enabling public re-use of data or samples from federally funded experiments, as mandated by federal Open Science policies.

SBGAT-BOT addresses the need for accurate graphical representations of complex experimental protocols for spaceflight and ground analog biological experiments. SBGAT-BOT was initially tested and validated using the "Chang-Blakely" collection of samples housed in NBISC (NASA Biological Institutional Scientific Collection). The tool supports three types of input data: tabular data (Excel or CSV), prompted/constrained manual entry, and expository text descriptions (PDF). SBGAT-BOT extracts specific experimental protocol features from these sources to generate graphical abstracts.

The tool's AI capabilities ensure accurate data extraction from PDFs and efficient processing of tabular data, producing standardized and consistent graphical outputs. Its flexibility and customizability make it applicable beyond the initial test case, enabling representations of various spaceflight and ground analog biological experiments within NASA's OSDR.

SBGAT-BOT's code is customizable, using icon and procedural libraries relevant to NASA biological experiments. It integrates visual analytics into machine learning workflows, significantly reducing the time and effort required to produce graphical abstracts. This supports broader goals of open science and data reuse, improving the accessibility of scientific data.

In summary, SBGAT-BOT is a powerful tool designed to create standardized graphical abstracts for NASA's biological experiments. It combines AI-based data extraction, image generation, and a user-friendly interface to enhance the accessibility and usability of scientific data, supporting open science and data reuse.