

# Intent for Autonomous Research and Discovery Platforms

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## Self-Driving Lab Reality

Emerging self-driving labs at MIT, Carnegie Mellon, Toronto, and emerging commercial deployments (Emerald Cloud Lab, Strateos) operate autonomous-experiment platforms. The platforms execute scientific protocols autonomously; principal investigators direct experiment classes; institutional review governs research scope.

Authority composition is structurally-required and currently implementationally-resolved.

## How Research Intent Composes

PI intent (research direction, experimental class, hypothesis space). Institutional intent (IRB approval scope, biosafety scope, research-misconduct guardrails). Regulatory intent (FDA-relevant for clinical-applicable research, EPA-relevant for environmental research). Lab-manager intent (operational scope, instrument reservation, safety mode).

Each is credentialed and admits structurally. Cross-authority research operations gain structural support.

# Research Automation Trajectory

Pharma-industry self-driving labs, materials-discovery autonomous platforms, and emerging AI-research-AI systems all face the architectural composition layer. The patent positions the substrate at the convergence point.