Product Backlog

ID	Title	Epic	User Story	Priority (MoSCoW)	Status	Acceptance Criteria	Functional Requirements	Non-Functional Requirements	Original Estimate	Actual Effort (In days)
1	Molecular Structure Visualization	Visualization	As a researcher, I want to visualize molecular structures in 2D/3D so that I can analyze chemical properties.	Must Have	Completed	Users can load and interact with molecular models in real-time.	3D model rendering, molecular interaction tools.	Fast rendering, cross-platform support.	5	2
2	SMILES Notation Parser	Molecule Generation	As a developer, I want to input SMILES notation and generate a molecular structure so that I can create custom molecules.	Must Have	Completed	SMILES input correctly converts to 3D molecular models.	SMILES parser, error handling, molecule validation.	High accuracy, error tolerance.	4	3
3	AI-Powered Molecule Generation	AI & ML	As a scientist, I want to generate new molecules based on AI predictions so that I can explore potential drug candidates.	Must Have	Completed	AI model successfully generates novel molecules with valid properties.	Graph Neural Networks for molecule generation.	Efficient model inference, cloud scalability.	7	6
4	Real-Time Collaboration	Collaboration	As a research team, we want to collaborate in real-time on molecular structures so that we can improve research efficiency.	Must Have	Completed	Multiple users can edit and comment on molecules simultaneously.	Live editing, version control, user roles.	Low-latency updates, data synchronization.	6	2
5	Group Messaging & Annotations	Collaboration	As a user, I want to chat and annotate molecular structures so that I can communicate with my team effectively.	Should Have	Completed	Users can send messages and leave annotations on molecular models.	Chat system, annotation overlay, notifications.	Secure, real-time messaging.	5	1
6	Molecular Property Prediction	AI & ML	As a researcher, I want to predict molecular properties like solubility and toxicity so that I can assess potential applications.	Should Have	Completed	ML models provide accurate predictions on molecular properties.	Pre-trained models for property prediction.	Accurate, explainable AI predictions.	6	7
7	Secure Data Storage	Infrastructure	As a user, I want my molecular data securely stored so that I can access my research anytime.	Must Have	Completed	Data is encrypted and stored securely in the cloud.	Cloud storage, encryption, user authentication.	GDPR compliance, high availability.	4	4

8	API for External Data Integration	Interoperability	As a developer, I want to integrate external molecular databases so that I can use existing research data.	Could Have	Completed	Supports integration with PubChem, ChEMBL, and PDB.	REST API, database connectors, OAuth.	Fast API response times.	5	2
9	User Authentication & Role Management	Security	As an admin, I want to manage user roles and permissions so that I can control data access.	Must Have	Completed	Users can sign up, log in, and have assigned roles.	OAuth, JWT authentication, admin panel.	Secure authentication, encrypted user data.	3	1
10	Export & Report Generation	Reporting	As a researcher, I want to export molecular data and reports so that I can document my findings.	Should Have	Completed	Users can export reports in PDF, CSV, and JSON formats.	Report generation module, export options.	Fast processing, downloadable formats.	4	2
11	Search & Filter Molecules	Usability	As a user, I want to search and filter molecules so that I can quickly find specific structures.	Must Have	Completed	Users can search by name, SMILES, or properties.	Full-text search, category filters, sorting options.	Fast retrieval, optimized indexing.	4	2
12	Version Control for Molecules	Collaboration	As a researcher, I want to track changes to molecular structures so that I can revert to previous versions.	Should Have	Completed	Users can view and restore previous versions of molecules.	Versioning system, undo/redo functionality.	Efficient storage of multiple versions.	5	6
13	AI-Powered Reaction Prediction	AI & ML	As a chemist, I want to predict reactions between molecules so that I can explore synthesis pathways.	Could Have	Completed	AI models suggest reaction mechanisms and potential products.	Transformer-based reaction prediction.	High accuracy, fast inference.	7	7
14	Customizable Dashboards	Usability	As a user, I want a customizable dashboard so that I can tailor the interface to my workflow.	Could Have	Completed	Users can configure widgets and data views.	Dashboard builder, drag-and-drop UI.	Responsive design, persistent user settings.	3	4
15	Mobile-Friendly Interface	Accessibility	As a researcher, I want a mobile-friendly UI so that I can access molecular data on the go.	Should Have	Completed	Platform works on mobile devices with responsive design.	Adaptive UI, touch-friendly controls.	Fast loading, optimized for mobile browsers.	5	2