

INNOVATION FOR BETTER PATIENT CARE



DIFFERENTIATE YOUR DRUG WITH NOVEL DELIVERY TECHNOLOGY

Battelle's cross-disciplinary teams deliver innovative solutions that meet today's market demands. We can help at any point in the development process.

We bring together experts from areas across diverse industries to produce leading-edge solutions to drug delivery challenges. From sensor development and power-supply design to preclinical testing and industrial design, Battelle has the depth and breadth of scientific and engineering expertise to solve what matters most in the world of drug delivery.

MATERIALS SCIENCE EXPERTISE

Battelle applies a fundamental understanding of materials science to improve product performance, cut manufacturing costs and reduce environmental impact.

- Protein production, purification and characterization.
- Characterization of physicochemical properties.
- *In vivo*, *ex vivo* and model testing.
- Device integration.
 - Materials analysis.
 - Materials selection.
 - Root cause analysis.

DEVICE ENGINEERING

Accelerate your R&D pipeline and meet market demands with our integrated design, development and testing services for drug and biologic delivery systems.

- Concept development.
- Applied research.
- Device development.
- Clinical research.
- Sustaining engineering.
- Materials enhancement.

HUMAN CENTRIC DESIGN

Get it right the first time to avoid risk and costly revisions. We combine behavioral and cognitive science with world-class design and engineering to make better, safer products.

- User research.
- Concept design and development.
- Rapid prototyping.
- User testing and validation.
- Heuristic analysis.
- Support for regulatory filings.

Capabilities

- Concept Design
- Device Engineering & Analysis
- Human Centric Design
- Design for Manufacturing
- Verification & Validation



RECORD OF INNOVATION

At Battelle, our job is to solve your problems. We deliver innovative solutions for a broad range of drug delivery methods.

Contrast Media Injector Design Analysis

Struggling with a sealing problem on an internally designed multiport pump, a drug delivery company asked Battelle to analyze the problem and design a solution. Battelle developed and tested new concepts that improved the injector's performance, creating a sustainable competitive advantage through new intellectual property assigned to the client.

Biologic Autoinjector Development

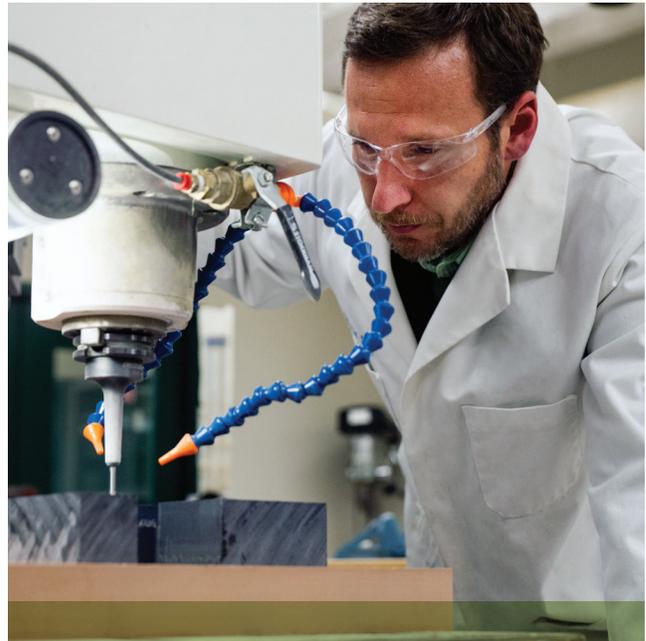
User research identified the need for a simple, intuitive device that helped to remove the fear and stigma of self-injections. Battelle supported design and development from concept origin through manufacturing transition. Ergonomic features such as the button, gripping surfaces and base were designed to help the user handle, site and operate the device appropriately and confidently. Design-for-manufacturing (DFM) techniques were used to scale the original product concept to one that could be manufactured readily using high-speed automation.

Infusion Pumps

Battelle's experience in improving the safety and performance of infusion pumps helps clear regulatory hurdles and get our clients' products to market faster. We developed pumps with improved accuracy, easy-to-use controls, longer run times and other benefits through leading-edge capabilities in usability studies, safety and risk management, regulatory expertise and advanced manufacturing.

Cross-Industry Innovation

Battelle launched an initiative in 2011 to reimagine the way delivery systems for biologic drugs are designed. The team created several solutions, including one that drew principles from the oil and gas industry. Battelle engineers adapted this concept for injectors, using miscible high-viscosity and low-viscosity solutions in a volume relevant to injectable biologic drugs.



At Battelle, 3D printing is leveraged throughout the development process to improve the safety, usability, and competitiveness of your products while avoiding costly design missteps.



Our Human Centric Design experts design and develop medical devices and products with human needs and capabilities in mind.

Every day, the people of Battelle apply science and technology to solving what matters most. At major technology centers and national laboratories around the world, Battelle conducts research and development, designs and manufactures products, and delivers critical services for government and commercial customers. Headquartered in Columbus, Ohio since its founding in 1929, Battelle serves the national security, health and life sciences, and energy and environmental industries. For more information, visit www.battelle.org.

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It can be done