Volume Distribution at Steady State

How extensively a drug distributes from blood/plasma into tissues

NEZU
Biotech GmbH

Dear Client,

first and foremost, thanks for downloading this free resource. All graphics in this report are predictions made by our AI systems. They show the profile of this ADMET endpoint for thousands of marketed drugs. We divided it by indication, and as you can see, it changes a lot from one category to another. Therefore, try to find the closest indication to the compounds you are currently developing.

Volume of distribution at steady state (VDss) answers how extensively does a compound leave the blood and distribute into tissues once distribution has reached equilibrium. VDss relates the total amount of drug in the body to its measured blood or plasma concentration.

VDss is usually determined during an intravenous pharmacokinetic study. Researchers administer a known dose to animals or human participants. They collect serial blood samples and measure drug concentrations, commonly by liquid chromatography–tandem mass spectrometry.

This experiment represents whole-body distribution under the tested physiological conditions. It does not reveal concentrations in individual organs. It also depends on assumptions about the site of elimination and the equilibration of drug binding. These assumptions can bias the estimate when elimination occurs outside the sampled central compartment or binding equilibrates slowly.

Distribution reflects the balance between retention in blood and partitioning into tissues. Strong plasma protein binding often restricts distribution. Tissue binding, membrane permeability, and lipid partitioning often increase it. Ionization and transporter activity also influence access to specific tissues.

A low VDss indicates that most drug remains within plasma or extracellular fluid. This can support predictable circulating exposure but restrict access to intracellular targets. A high VDss indicates extensive tissue partitioning and can support target-organ exposure. It can also reduce plasma concentrations, increase tissue accumulation, and complicate removal.

Neither direction is universally favorable. VDss must be interpreted with systemic clearance because both parameters influence mean residence time and dosing behavior. **It must also be assessed with plasma protein binding.**

We generated these insights using advanced AI systems designed to analyze complex biotech data and highlight potential trends. While we strive for accuracy, AI models

can occasionally make mistakes or miss context, so please treat these predictions as informative guidelines rather than absolute facts.

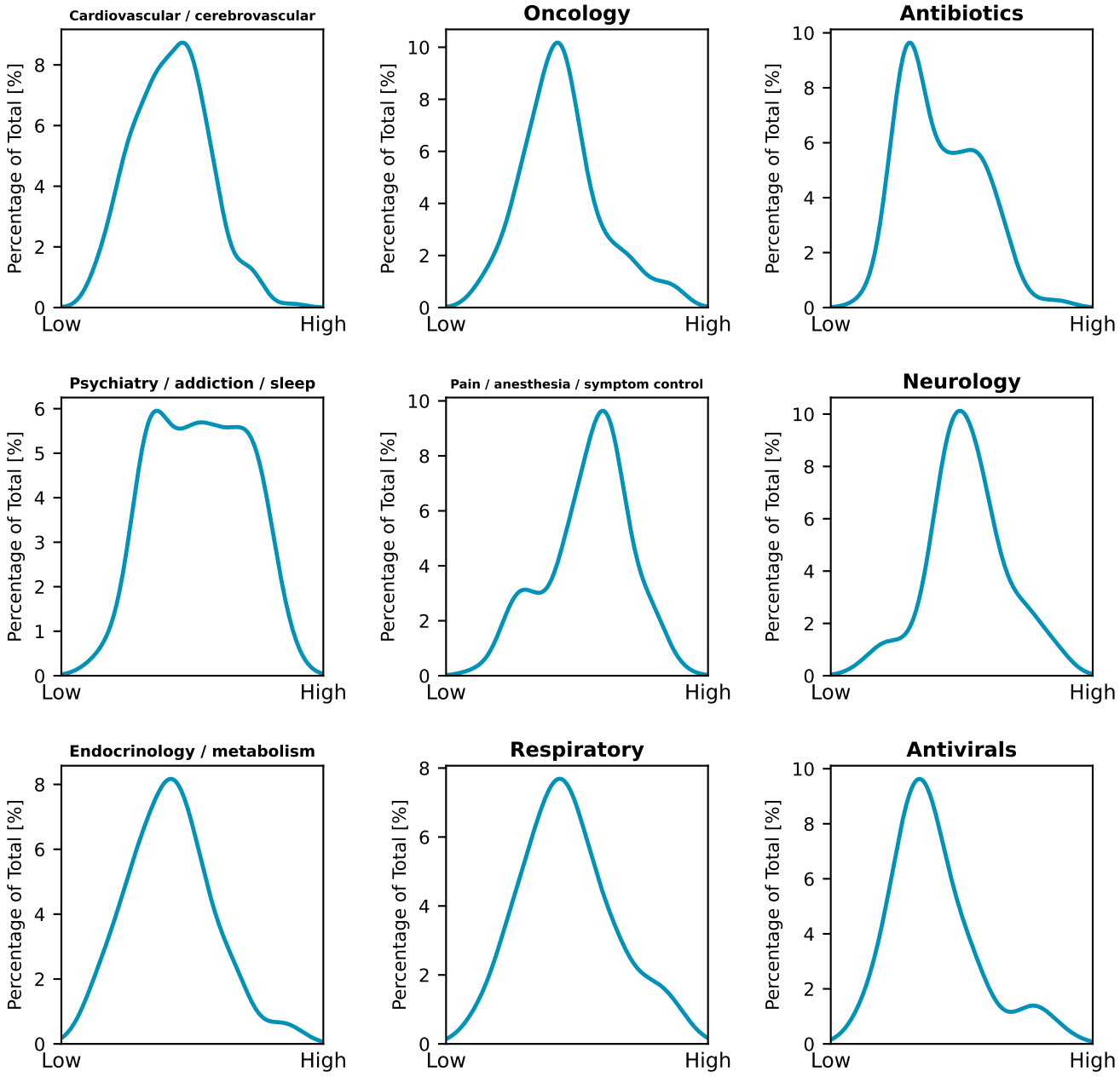
This report is provided for general informational and educational purposes only, not for medical diagnosis, treatment decisions, or financial advice. Because individual circumstances and data can vary, we cannot be held responsible for any decisions made or losses incurred based on these predictions.

Now that we got this out of the way, we genuinely hope these results are useful for your research.

Sincerely,

Your friends at Nezu Biotech GmbH.

Volume Distribution Steady State (VDSS)



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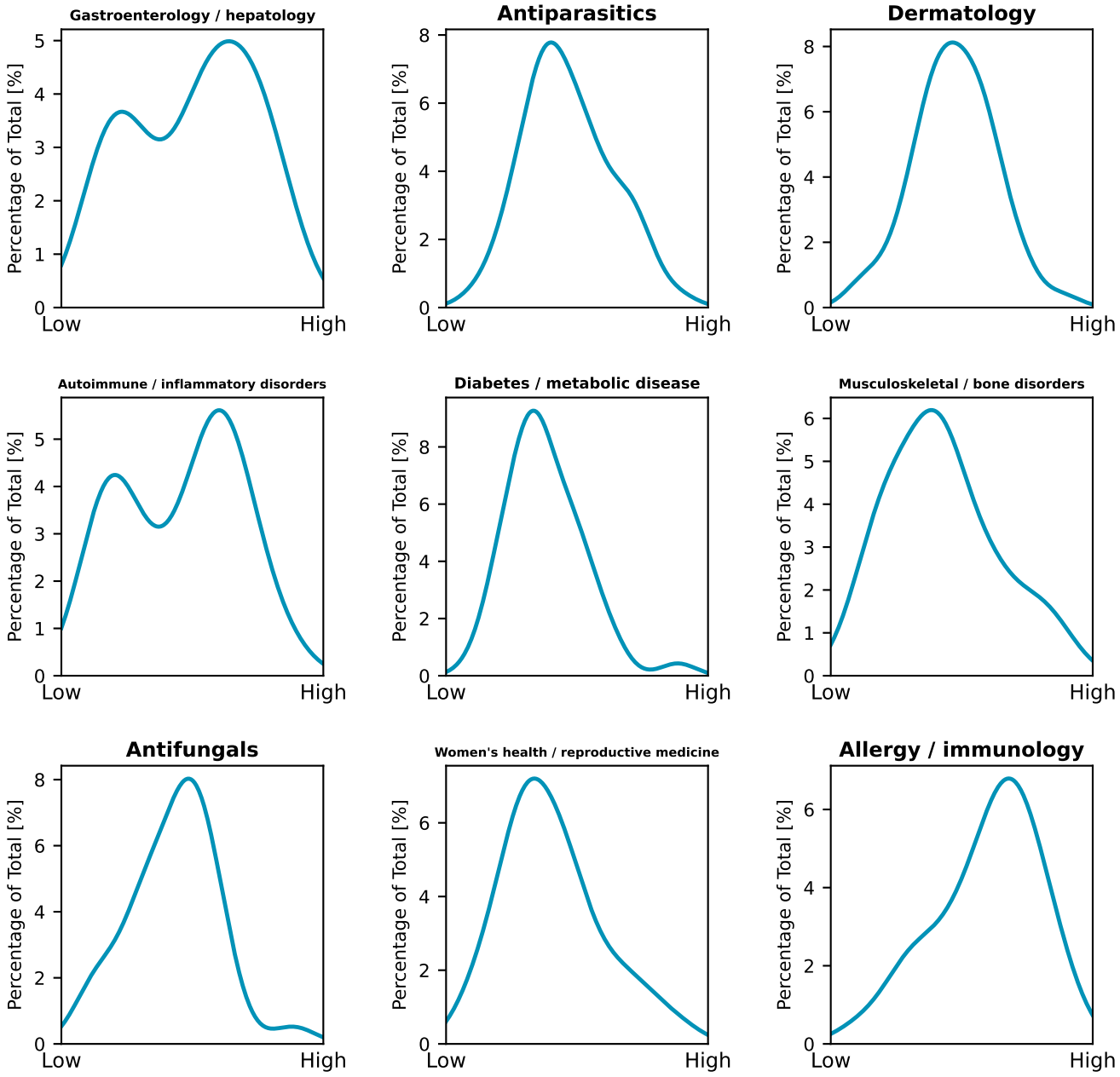

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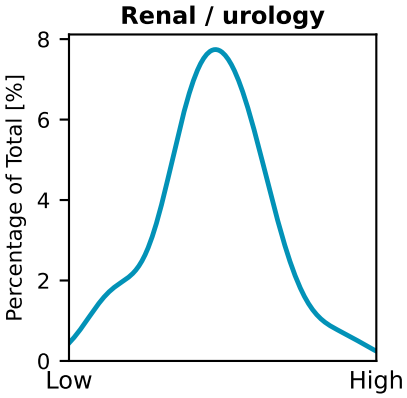

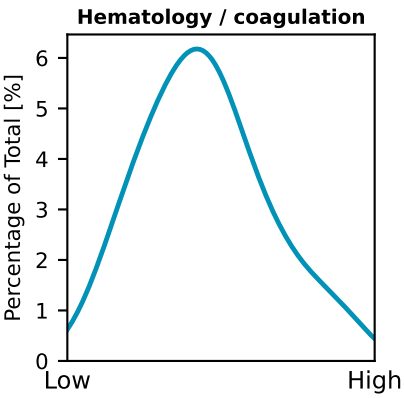

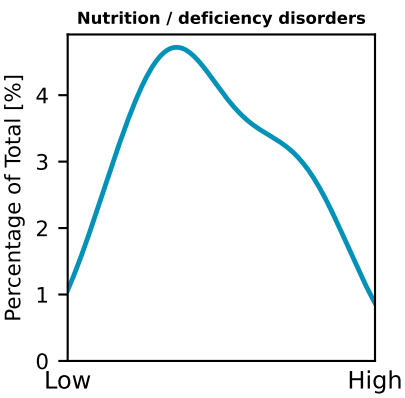

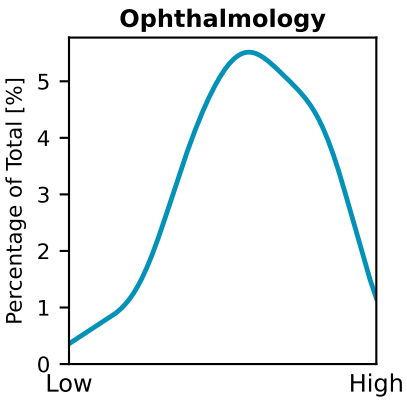

Derived from thousands of marketed drugs