xBxBio Outlines a Virtual Heart Vision Linking Rhythm, Mechanics and Blood Flow

The company outlines a physiology-first approach to patient-specific cardiac modeling, connecting electrical activity, muscle mechanics and circulation.



xBxBio's Virtual Heart development vision, connecting electrical activity, heart-muscle mechanics and blood flow to support clinician-guided, patient-specific assessment.

IRVINE, CA, UNITED STATES, September 29, 2026 /EINPresswire.com/ -- xBxBio is outlining a physiology-first direction for its Virtual Heart: a patient-specific cardiac representation intended to connect electrical activity, myocardial mechanics, and blood flow within its broader Connected Cardiovascular Intelligence platform.

The development objective is to help clinicians examine how these interacting processes relate in an individual patient, rather than treating a visually detailed heart as an explanation of its function. The company is presenting the scientific direction guiding this work, not announcing a completed clinical product.

> Our goal is a Virtual Heart that does more than resemble anatomy: helping clinicians examine how electrical activity, muscle mechanics and blood flow fit together."
>
> *Kenneth Bean, xBxBio*

From electrical signal to pumping function

The proposed approach brings together three domains. Electrophysiology concerns the timing and spread of electrical activation. Myocardial mechanics concerns how heart muscle deforms, contracts, and relaxes. Hemodynamics concerns pressure, blood flow, and interactions among the heart, valves, and circulation.

xBxBio's aim is to relate these domains using available patient evidence and explicitly stated modeling assumptions. The intended result is not simply several measurements displayed together, but an examinable representation of how electrical, mechanical and circulatory findings may fit together.

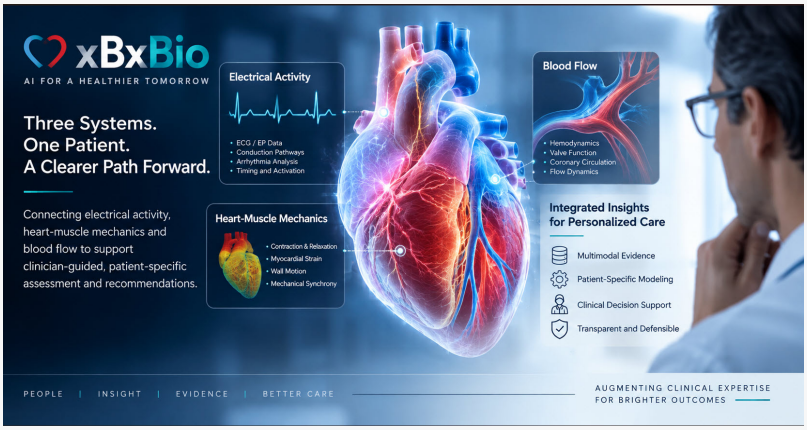
The company frames the distinction this way: a virtual heart should be evaluated not only by

how convincingly it moves, but by what evidence supports the behavior it represents.

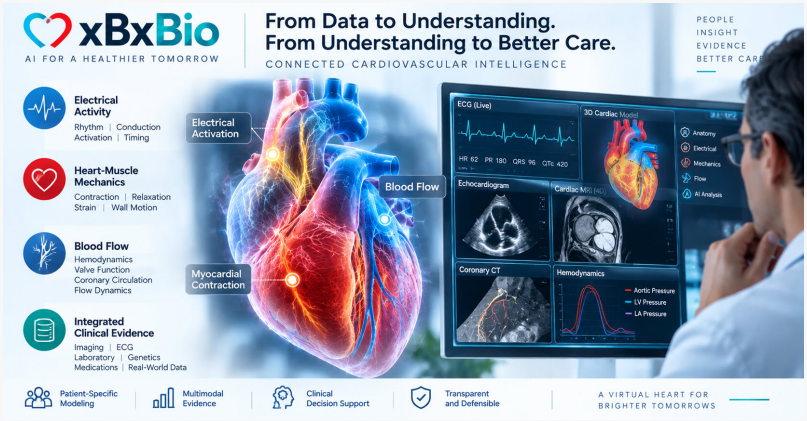
Patient-specific must mean more than patient-shaped

The proposed work would combine imaging-derived anatomy with relevant electrical, functional and clinical evidence. Patient-specific geometry alone would not establish the individual's tissue properties, activation sequence, contractile behavior or pressure conditions. Those features would require appropriate measurement, estimation, and evaluation.

Observed findings would need to remain distinguishable from calculated quantities, estimated parameters, and unmeasured properties. Where the available evidence cannot determine a feature reliably, the representation should preserve that limitation rather than imply precision through visual detail.



xBxBio's for connecting electrical activity, heart-muscle mechanics and blood flow within a patient-specific Virtual Heart.



xBxBio's development vision for connecting cardiac physiology with ECG, imaging and other clinical evidence.

A research example illustrates the clinical question. In a synthetic case, electrical activation findings, regional contraction measurements, and flow observations could be assessed for compatibility under stated assumptions. The objective would be to examine whether a proposed physiological interpretation is consistent with the available observations, and what remains unresolved. This is a proposed evaluation scenario, not a reported experiment or patient outcome.

Connecting physiology to clinical reasoning

Within the wider xBxBio cardiac platform, the Virtual Heart is intended to support clinicians in developing and revisiting patient-specific recommendations. The physiological representation would provide context for examining findings and hypotheses, while clinical judgment, patient circumstances and the evidence needed for a particular decision remain central.

The emphasis is on supporting clinical reasoning, not claiming that a simulation can reproduce every property of a person's heart or determine the correct treatment independently.

The next scientific challenge is credibility at each intended function level. Planned evaluation would need to distinguish whether software performs its specified calculations, whether modeled behavior agrees with appropriate physiological evidence, and whether the resulting information is useful in the intended clinical workflow. Agreement with data used to fit a model would not, by itself, establish performance on new observations.

xBxBio welcomes discussions with clinicians, imaging specialists, electrophysiologists, computational researchers and prospective collaborators about the evidence and evaluation needed for this approach. Background materials are available through the company's Research and Publications page. Scientific and media inquiries can be directed through its Request a Briefing page.

About xBxBio
xBxBio is developing Connected Cardiovascular Intelligence to support clinician-guided, patient-specific assessment and recommendations. Its work connects cardiovascular evidence, physiological modeling, longitudinal context, and responsible human oversight.
Clinical-use notice

The cardiac platform and Virtual Heart are under development and are not currently offered for clinical use. Described functions are development objectives, not claims of demonstrated clinical performance, patient benefit, or regulatory authorization.

Kenneth Bean
xBxBio
+1 617-320-6768
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