

GÉNÉRA

GÉNÉRATE

TISSUE MUST BE EXAMINED IN ITS OWN RIGHT. THERE IS AN IMPERATIVE FOR A DISTINCT DISCIPLINE OF TISSUE STUDIES, DEDICATED TO FORGING ITS UNIQUE LEXICON AND SUITE OF METHODOLOGIES. THIS FIELD IS ESSENTIAL TO COMPLETE THE REVOLUTION IN TISSUE ENGINEERING AND TO CONCEPTUALIZE A MACHINE—**GÉNÉRA**—THAT REGARDS AND CONSTRUCTS TISSUE WITH THE AUTHENTICITY IT DEMANDS.

AUTHORS

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ACKNOWLEDGMENTS

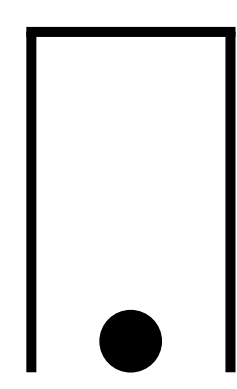
Alexander Vetushinsky
Roman Deev

INTRODUCTION

THE QUEST TO **CREATE COMPLEX MULTICELLULAR SYSTEMS** HAS BEEN A DRIVING FORCE BEHIND MAJOR ADVANCES IN THE METHODOLOGIES AND TOOLS USED BY RESEARCHERS AND ENGINEERS IN **TISSUE ENGINEERING AND REGENERATIVE MEDICINE** (TERM).

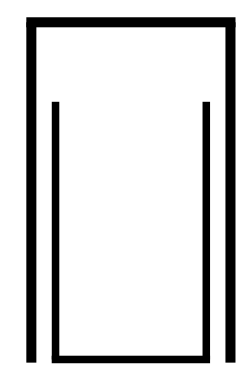
THE PROPER WAY OF CREATION OF SUCH SYSTEMS THOUGH REQUIRES NOT ONLY METHODOLOGY, BUT A METHODOLOGICAL RESEARCH, NAMELY **TISSUE STUDIES**

We can craft a quick yet elegant classification of conceptual TE (Tissue Engineering) approaches to work with.



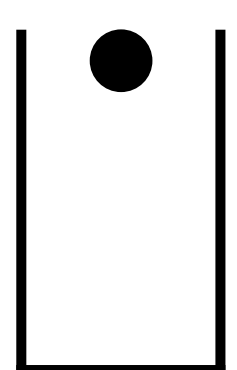
Morphism

Artificial mechanical organs prioritize form over matter, echoing early biomedical engineering attempts that focused on replicating organ structures, often at the expense of intricate biochemical functionalities.



Hyломorphism

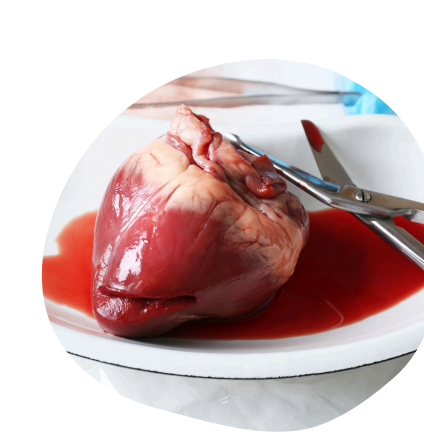
This highlights artificial living organs where form and matter, reflecting Aristotle's hylomorphism, are melded holistically in tissue engineering, underscoring their equal importance in crafting a functional organ.



Hylism

This signifies self-assembling organoids where matter leads and form follows. Rooted in Hylozoism, it implies with the right components (matter), the desired structure (form) will spontaneously emerge, mirroring advanced methods like organoid culture.

Our TE approaches can be straightforwardly related to these concepts and explained in their terms.



In both mechanical and living heart transplants, the overriding principle is the dominance of the donor's form. This form, whether artificial or biological, supersedes the recipient's matter, imposing its own cellular architecture and operational mechanisms.



A recellularized heart bridges the realms of biology and engineering. A normal heart is decellularized to retain only an empty scaffold (form), which is then repopulated with the patient's own cells (matter), blending biological authenticity with engineered precision.



In scenarios where form is secondary, heart organoids emerge. Cells, acting as active matter, autonomously assemble into heart components or even an entire heart, showcasing a blend of self-organization and biological intricacy.

[Image CAPTION] Canva repository



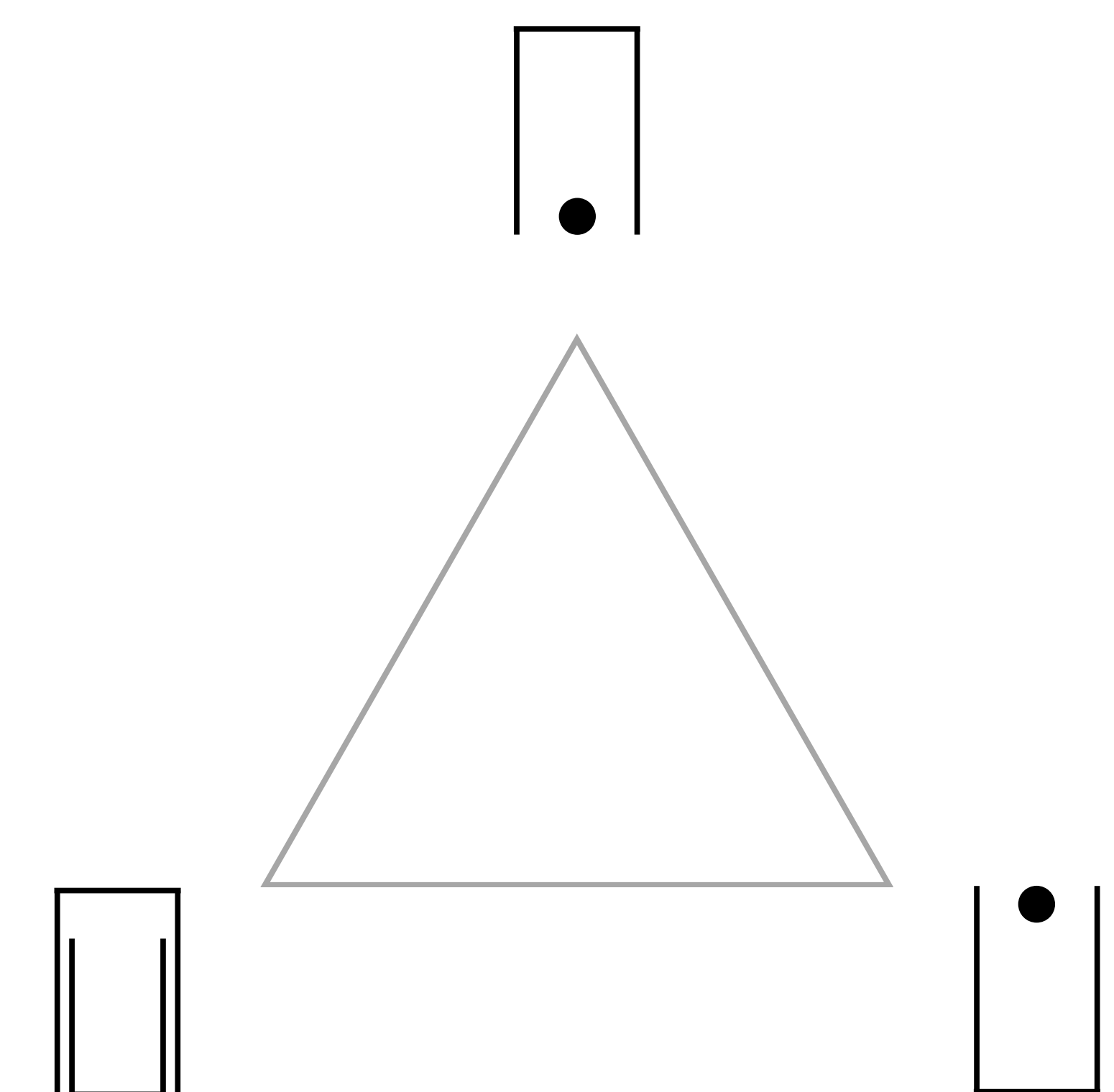
Liminality is a concept in anthropology, where an individual passing through a rite no longer holds their pre-ritual status, but is still not finished their rite, staying in the middle zone. **Tissue liminality is a new conceptual field** to think of tissue engineered constructs, which in more practical terms denotes that it is already not a dead matter but is not a developed tissue.

The revolution is only finished when a tissue exits its liminal state

[Image CAPTION] Canva repository

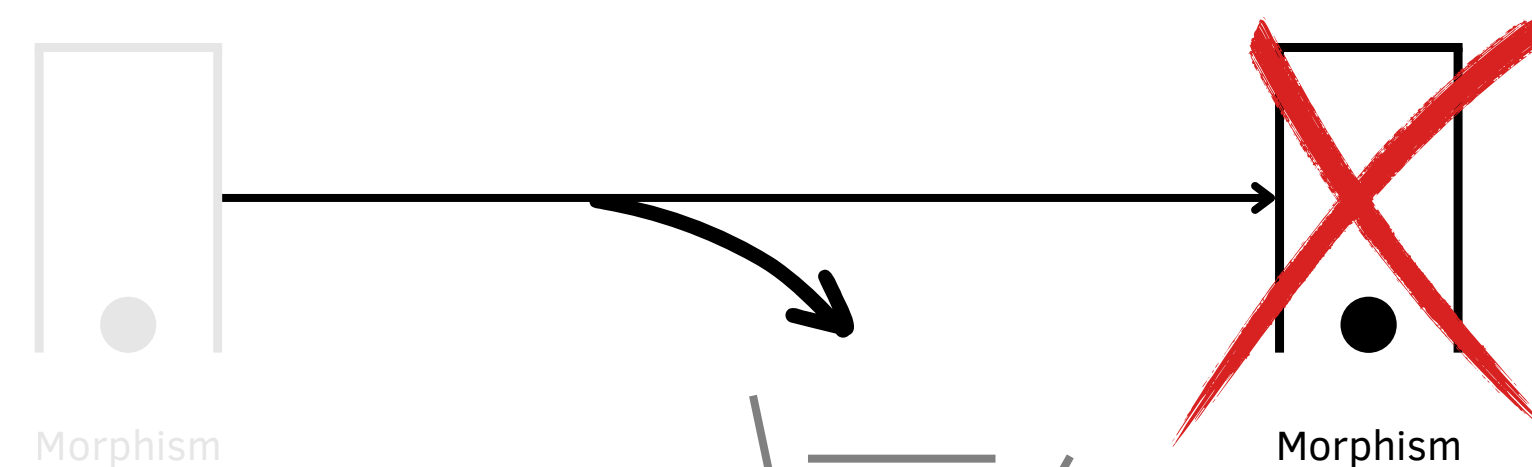
It seems that conceptualization often comprises three elements, possibly because we find comfort in smaller numbers like 3 (Plato, Hegel, Kant) or 4 (Aristotle, Heidegger). Following this common affinity for the number »3,« we can introduce a new concept: the **Tissue Engineering Triangle (TET)**.

What interests us the most in this triangle, is the triangle itself. How do we switch between these different modes? How can we employ this »switching« to our tissue engineering practices? Is it really a triangle and there are no other nodes?



TISSUE ENGINEERING TRIANGLE (TET)

THE REVOLUTION IS NEVER FINISHED



Although the TET offers more or less good classification of modern TE approaches, they are not developed to their fullest extent

CONCLUSION

To truly advance the revolution in tissue engineering, we must seize control of its essential components, seize the »a) telephones, b) telegraphs, c) railway stations« of tissue engineering to bring the revolution to its end.

The conceptual machine which will approach the field of tissue studies is called **Généra**, and its mission is to turn the field of regenerative medicine into **générative medicine**

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2. Regev, J. (2021). Radical TJ-ing. Hyle Press.
3. Regev, J. (2015). Coincidenceology: A Short Treatise on the Method. Translit.