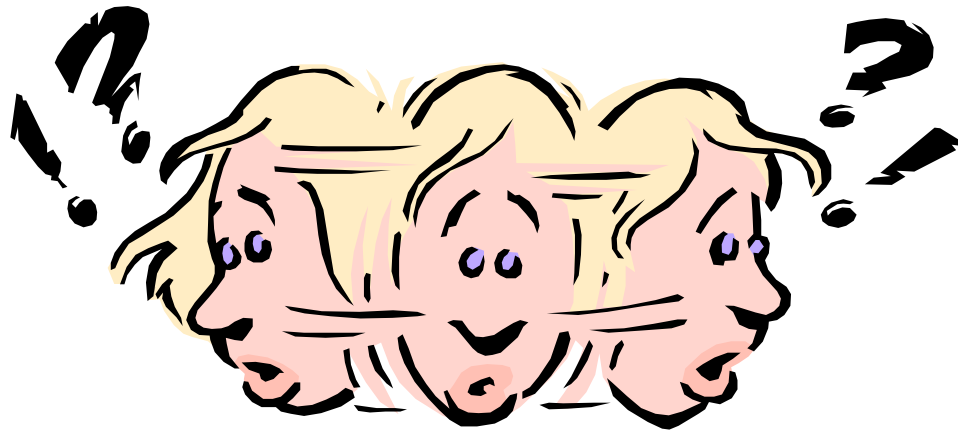
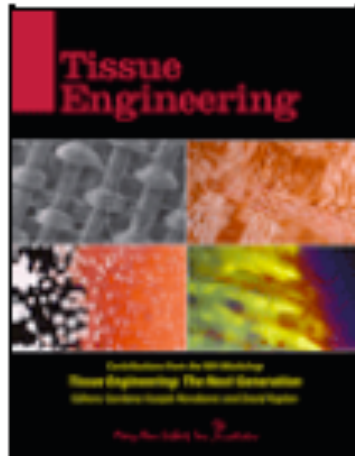


# Need for Tissue Engineering



# Were to Begin?

## Tissue Engineering



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# A small selection of papers

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[Gordana Vunjak-Novakovic](#), [David Kaplan](#)  
Tissue Engineering Dec 2006, Vol. 12, No. 12: 3259-3259.  
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- ❑ **Free Tissue Engineering: The Next Generation**  
[Gordana Vunjak-Novakovic](#), [David L. Kaplan](#)  
Tissue Engineering Dec 2006, Vol. 12, No. 12: 3261-3263.  
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[Ioannis Yannas](#), [David Kaplan](#), [Gordana Vunjak-Novakovic](#)  
Tissue Engineering Dec 2006, Vol. 12, No. 12: 3265-3283.  
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[Milica Radisic](#), [Michael V. Sefton](#), [David Kaplan](#), [Gordana Vunjak-Novakovic](#)  
Tissue Engineering Dec 2006, Vol. 12, No. 12: 3285-3305.  
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[Antonios G. Mikos](#), [Susan W. Herring](#), [Pannee Ochareon](#), [Jennifer Elisseeff](#), [Helen H. Lu](#),  
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[David Kaplan](#), [Gordana Vunjak-Novakovic](#)  
Tissue Engineering Dec 2006, Vol. 12, No. 12: 3307-3339.

# Excellent Reviews

Langer R., Vacanti J.P. Tissue engineering. *Science* 260, 920, 1993.

Butler, D.L., Goldstein, S.A., and Guilak, F. Functional tissue engineering: The role of biomechanics. *J Biomech Eng* 122, 570, 2000.

Freed, L.E., Vunjak-Novakovic, G., Biron, R., Eagles, D., Lesnoy, D., Barlow, S., and Langer, R. Biodegradable polymer scaffolds for tissue engineering. *Bio/Technology* 12, 689, 1994.

# Need for Tissue Engineering

❖ Damaged organs through -

# Problems to Overcome

❖ Performance requirements

# Solutions

❖ Prostheses

# Future?

❖ Cloning

# History

- ❖ Egyptians and South American teeth implants
- ❖ 1<sup>st</sup> pacemaker 1950's
- ❖ 1<sup>st</sup> artificial heart valve implanted by Hufnagel 1952
- ❖ 1<sup>st</sup> artificial hip replacement by Charney 1954