alginate

NOVAMATRIX
Ultrapure Biopolymer Systems

PEPTIDE-COUPLED ALGINATES

Successful engineering of tissue constructs may one day allow routine replacement of damaged organs and tissues. Alginates are well established as matrix materials for cells or tissue within regenerative medicine and have a promising potential in a variety of biomedical applications [1]. Alginates are naturally-derived polysaccharides composed of (1-4)-linked β-D-mannuronate (M-units) and α-L-guluronate (G-units) monomers, which vary in amount and sequential distribution along the polymer chain depending on the source of the alginate. Alginates suitable for biomedical use is today commercially available from NovaMatrix under the tradename PRONOVA.

NOVATACH is a series of peptide-coupled alginates which facilitate and promote interaction between cells and alginate-based scaffolds and matrices resulting in improved cell functionality and viability. NOVATACH extends the range of high quality, well documented, ultrapure and low endotoxin PRONOVA alginates for cell therapy and tissue engineering applications and has utility in formulations where cell-to-matrix interaction is beneficial.

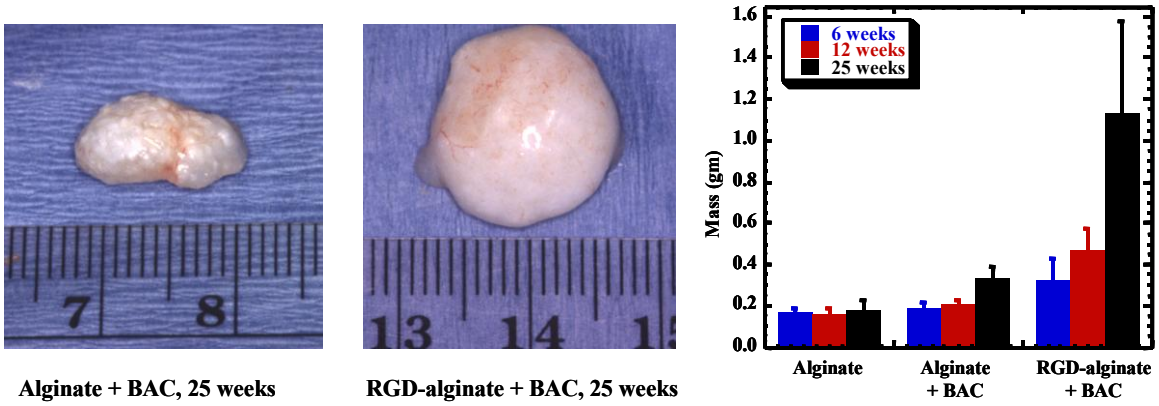

Figure 1: RGD-alginate improves *in-vivo* cartilage formation in mice. Bovine Articular Chondrocytes (BAC) grown in alginate gives an inhomogeneous and loose structure (left). BAC grown in RGD-alginate gives a homogeneous and firm structure (middle), and displays significantly higher growth rate than BAC in alginate alone (right). Data from Alsberg et al. [3].

NOVATACH peptide-coupled alginates have been modified using aqueous carbodiimide chemistry to covalently graft peptide sequences to alginate molecules [2]. Cell interaction with biomaterials is mediated through transmembrane receptors that recognize adhesion molecules at material surfaces. The RGD peptide sequence is a common example of such adhesion ligand and it has been shown that RGD-alginates successfully initiate biological interactions between alginate hydrogels and cells [2,3].

NOVATACH peptide-coupled alginates are available in vials containing 100 mgs of sterile-filtered and lyophilized material. The following peptide sequences are currently available:

NOVATACH G/M RGD (G**RGD**SP-coupled high G or high M alginate)
NOVATACH G VAPG (VAPG-coupled high G alginate)
NOVATACH M REDV (REDV-coupled high M alginate

References:
[1] J.E. Melvik, M. Dornish, Alginate as a carrier for cell immobilisation, Book Chapter: Fundamentals of cell Immobilisation Biotechnology (2004), ISBN 1-4020-1887-8, 33-51.
[2] J.A. Rowley, G. Madlambayan, D.J. Mooney, Alginate hydrogels as synthetic extracellular matrix materials, Biomaterials **20** (1999), 45-53.
[3] E. Alsberg, K.W. Anderson, A. Albeiruti, J.A. Rowley, D.J. Mooney, Engineering growing tissues, PNAS **99** (2002), 12025-12030.

Patents
NovaMatrix/FMC Corporation does not warrant against infringements of patents of third parties by reason of any uses made of the product in combination with other material or in the operation of any process, and purchasers assume all risks of patent infringement by reason of any such use, combination, or operation.

Warranty
Because of the numerous factors affecting results, NovaMatrix/FMC products are sold under the understanding that purchasers will make their own tests to determine the suitability of these products for their particular purpose. The several uses suggested by NovaMatrix/FMC Corporation are presented only to assist our customers in exploring possible applications. All information and data presented are believed to be accurate and reliable, but are presented without the assumption of any liability by NovaMatrix/FMC Corporation.

Technical Service
The information contained in this bulletin is intended to be general in nature. Techniques and data pertaining to specific uses for NovaMatrix/FMC products and new developments will be published periodically in the form of supplemental application bulletins. Our technical staff is ready to offer assistance in the use of NovaMatrix/FMC products.

Regulatory Status
NOVATACH peptide-coupled alginates are classified as research products, and are not intended for human use.

PRONOVA™ sodium alginate meets the standards set forth in the current editions of the United States Pharmacopeia/National Formulary and European Pharmacopoeia. PRONOVA™ sodium alginate satisfies ASTM F 2064 for use in tissue engineered medical products (TEMPs). PRONOVA™ sodium alginate is manufactured in compliance with current Good Manufacturing Practice and described in a DMF submitted to the US FDA.

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PIB-NOVATACH-122011