Self-Assembling Multidomain Peptide Nanofibers for Delivery of Bioactive Molecules and Tissue Regeneration

Amanda N. Moore and Jeffrey D. Hartgerink

Department of Chemistry and Bioengineering, Rice University, 6500 Main Street, Houston, Texas 77005, United States

SI Table 1. Published Multidomain Peptide Sequences

Peptide Sequence	*Reference*	*Designed Bioactivity*
$(QL)_6$	11	N/A
$K(QL)_6K$	11	N/A
$K_2(QL)_2K_2$	11	N/A
$K_2(QL)_3K_2$	11	N/A
$K_2(QL)_4K_2$	11	N/A
$K_2(QL)_5K_2$	11	N/A
$K_2(QL)_6K_2$	11, 12, 21, 14	N/A
$K_3(QL)_6K_3$	11	N/A
$K_4(QL)_6K_4$	11	N/A
$K_2(QF)_6K_2$	14	N/A
$K_2(QFQL)_3K_2$	14	N/A
$K_2(QW)_6K_2$	14	N/A
$K_2(QY)_6K_2$	14	N/A
$K_2(SL)_6K_2$	12, 13, 16, 21, 23, 29, 31	N/A
$K_2(TL)_6K_2$	13	N/A
$E(QL)_6E$	12	N/A
$E(SL)_6E$	12	N/A
$E_2(SL)_6E_2$	21	N/A
$E(CLSL)_3E$	12	N/A
$K_2(SL)_2SA(SL)_3K_2$	29	N/A
$K_2(SL)_2(SA)_2(SL)_2K_2$	29	N/A
$E_2(SL)_6E_2$GRGDS	17, 27	cell adhesion
$K(SL)_3RG(SL)_3K$GRGDS	13, 16, 19, 20, 23, 24, 25, 26, 28, 31	cell adhesion & enzymatic degradation
$K(TL)_2SLRG(TL)_3K$GRGDS	13	cell adhesion & enzymatic degradation
$K_2(SL)_6K_2$GRGDS	13, 16	cell adhesion
$K_2(TL)_6K_2$GRGDS	13	cell adhesion
$K(SL)_3RG(SL)_3K$	16, 30,31	enzymatic degradation
$K_2(SL)_3RG(SL)_3K_2$	16	enzymatic degradation
$K(SL)_3RG(SL)_3K$GKLTWQELYQLKYKGI	30, 31	enzymatic degradation & angiogenesis

SI Table 2. Cell and Tissue Culture using Multidomain Peptides

Cell Type Used	*Peptide(s) examined*	*Culture system*	*Reference*
SHED	$K_2(SL)_6K_2$ $K_2(SL)_6K_2$GRGDS $K(SL)_3RG(SL)_3K$ $K(SL)_3RG(SL)_3K$GRGDS $K_2(TL)_6K_2$ $K_2(TL)_6K_2$GRGDS $K(TL)_2SLRG(TL)_3K$GRGDS	2D/3D	13, 16
DPSC	$K(SL)_3RG(SL)_3K$GRGDS	2D/3D	25
hMSCs	$K_2(SL)_6K_2$ $K(SL)_3RG(SL)_3K$GRGDS $K(SL)_3RG(SL)_3K$GKLTWQELYQLKYKGI	2D	31
HUVEC	$K(SL)_3RG(SL)_3K$GRGDS $K(SL)_3RG(SL)_3K$GKLTWQELYQLKYKGI	2D	30, 31
THP-1	$K_2(SL)_6K_2$ $K(SL)_3RG(SL)_3K$GRGDS	2D	19, 23
Ex vivo mandible slice	$K(SL)_3RG(SL)_3K$GRGDS	organ culture	20
Whole blood	$K(SL)_3RG(SL)_3K$GRGDS	blood clotting model	26

SI Table 3. *In Vivo* Studies of Multidomain Peptides

Model	*Peptide(s) examined*	*Reference(s)*
Subcutaneous injection	$K(SL)_3RG(SL)_3K$GRGDS $K(SL)_3RG(SL)_3K$	19, 23, 28, 31
Hind Limb Ischemia	$K(SL)_3RG(SL)_3K$ $K(SL)_3RG(SL)_3K$GKLTWQELYQLKYKGI	30
Perioperative bleeding: Liver Incision	$K(SL)_3RG(SL)_3K$GRGDS	26

SI Table 4. Delivery of Bioactive Molecules using Multidomain Peptides

Molecule	*Reference*
hESC secretome	17
Suramin	19
MCP-1	23, 24
IL-4	23
EGF	24
PlGF-1	24, 28
TGFβ1	25
FGF2	25
VEGF	25
Batroxobin	26
SN-38	29
Diflunisal	29
Etodolac	29
Daunorubicin	29
Levofloxacin	29
Norfloxacin	29
VEGF	31

All reference numbers refer to citations in the main text.