



JUNBA2008 Technology Fair

Design of protein function-mimicking peptides and therapeutic human antibodies by phage library

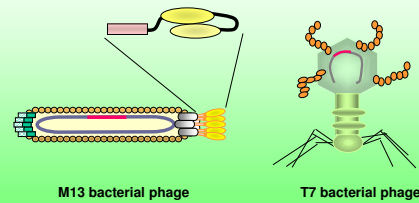
Department of Bioengineering, Faculty of Engineering,
Kagoshima University

Yuji Ito, Associate Professor (Ph. D.)



JUNBA2008 Technology Fair

Phage display



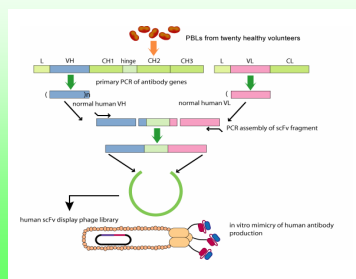
M13 bacterial phage

T7 bacterial phage



JUNBA2008 Technology Fair

Human antibody phage library



ATL
(Adult T cell leukemia
caused by infection of
HTLV-1)



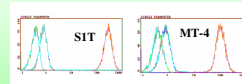
S1T cell
(Target cell)



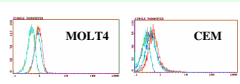
JUNBA2008 Technology Fair

S1T-specific scFv antibody dimer (diabody) can induce a strong apoptotic cell death

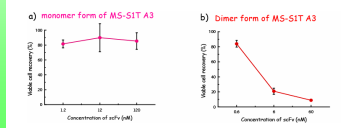
Binding to HTLV-1 carried cell



Binding to HTLV-1 non-carried cell



S1T-specific scFv dimer strongly induces cell death on S1T



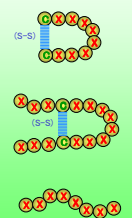
JUNBA2008 Technology Fair

Construction of huge peptide library on T7 phage

Form	Diversity
CX4C	1.2×10^9
CX5C	1.2×10^9
CX6C	1.8×10^9
CX7C	1.4×10^9
CX8C	1.3×10^9
CX9C	1.5×10^9
CX10C	1.8×10^9
X3CX4CX3	1.4×10^9
X3CX5CX3	1.7×10^9
X3CX6CX3	1.5×10^9
X3CX7CX3	1.6×10^9
X3CX8CX3	9.0×10^8
X3CX9CX3	1.0×10^9
X3CX10CX3	5.4×10^8
X16	2.5×10^7
X12	7.0×10^8
X18	6.3×10^8
X20	1.8×10^9

Total
 2.5×10^{10}

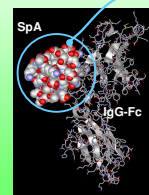
X: randomized amino acid



JUNBA2008 Technology Fair

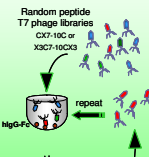
Human IgG Antibody-specific binding peptide

Staphylococcus aureus
protein A (SpA)



SpA mimic peptide
binding to human Fc

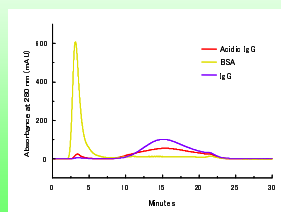
Application :
1. Purification of IgG
2. Detection of IgG
3. Lead structure for medicine



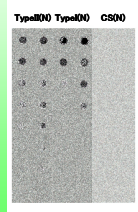
JUNBA2008 Technology Fair

Type I peptide specific to human IgG

Affinity purification of human IgG
by peptide-conjugated column



Human IgG detection on dot blot
by using biotinylated peptide



JUNBA2008 Technology Fair

Type II peptide specific to abnormal conformer of human IgG

Abnormal conformer of hIgG is
generated by acidic treatment in the
purification process using SpA column.

