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The identification and characterization of Interleukin-17 family ligands and receptors in fish

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- Contents -

- Search and analysis of teleost IL-17L/R genes
  1. Analysis of IL-17 ligand genes (medaka)
     genome synteny, homology analysis,
     expression study (in un-stimulated tissues,
     LPS stimulated intestine)

  2. Analysis of IL-17 receptor genes (*Fugu*)
     genome synteny, homology analysis

IL-17 ligands isolation

Human

IL-17 family ligands	*secreting cells*	*main functions*
IL-17 (IL-17A)	T cells (T_{H17})	Neutrophil recruitment and immunity to extracellular pathogen
IL-17F	T cells (T_{H17})	
IL-17B	Numerous tissues	Pro-inflammatory ?
IL-17C	Numerous tissues	
IL-17D	Numerous tissues	
IL-17E (IL-25)	Th2 cells	Induces Th2 immune responses

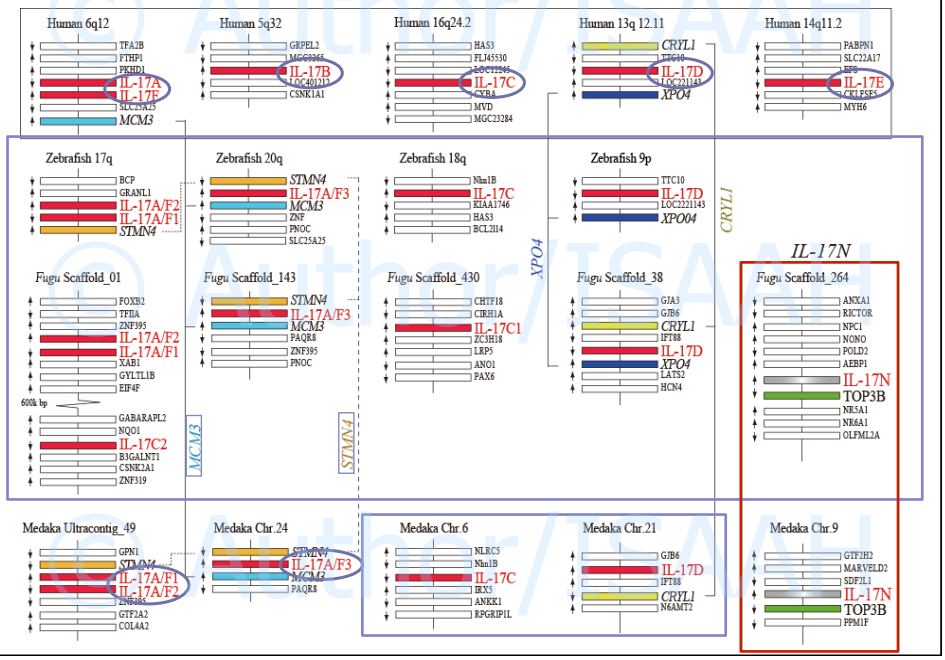
Teleost

IL-17 family ligands	*Fish species*
IL-17A/F	zebrafish, trout, salmon, *Fugu*
C	zebrafish, trout, *Fugu*
D	zebrafish, trout, salmon, *Fugu*
N	*Fugu*

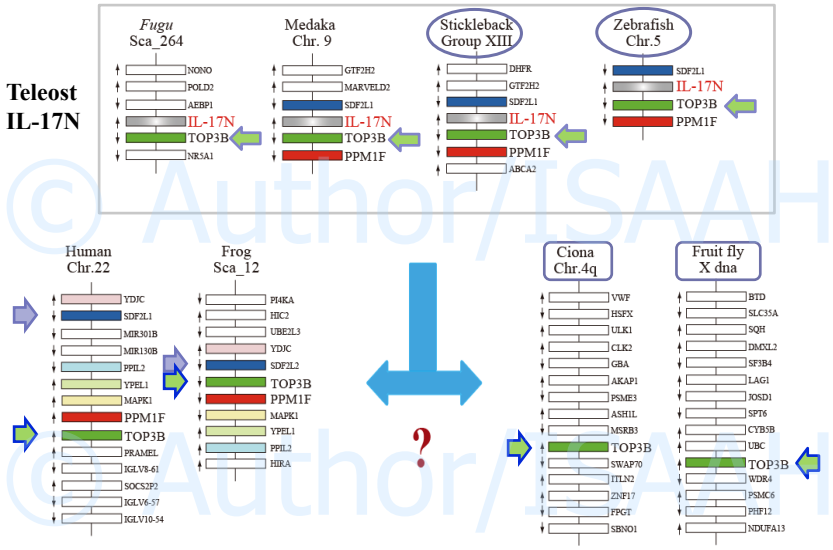
Invertebrate

IL-17 family ligands	*species*
IL-17	*Ciona*, Oyster, Sea urchin

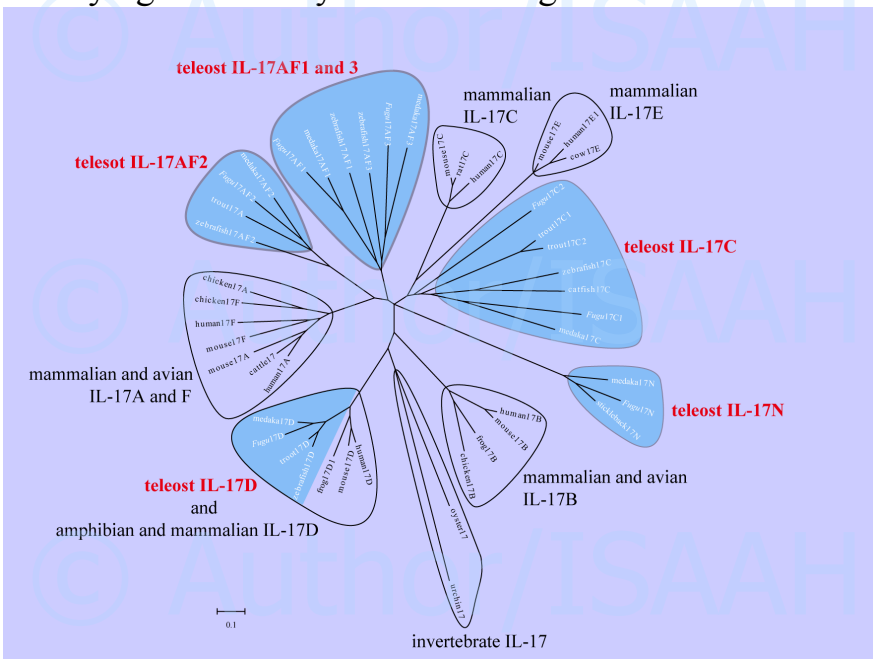
Synteny analysis of IL-17 genes (Human and Teleost)



- Synteny analysis of teleost IL-17N gene
  (VS other vertebrates and invertebrates)



- Phylogenetic analysis of IL-17 ligands



Expression analysis of IL-17 ligands in medaka

tissues:
Intestine, Kidney, Spleen, Liver, Heart, Brain, Skin, Muscle, Gill

Intestine stimulated with LPS(20 μg/ml) for 1, 4, 8, 12 and 24 h

↓

Total RNA extraction

↓

cDNA synthesis

↓

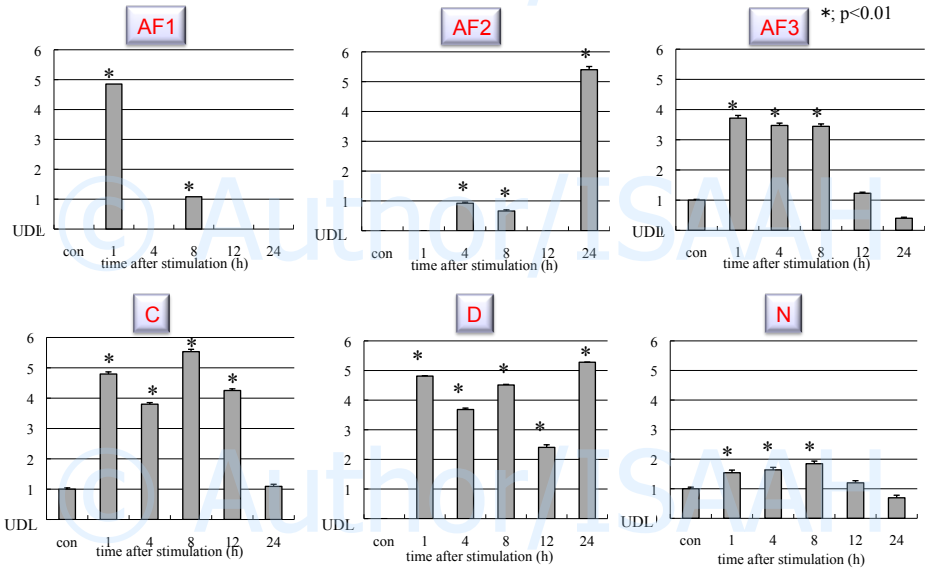
PCR using specific primers for IL-17 / β-actin genes

↓

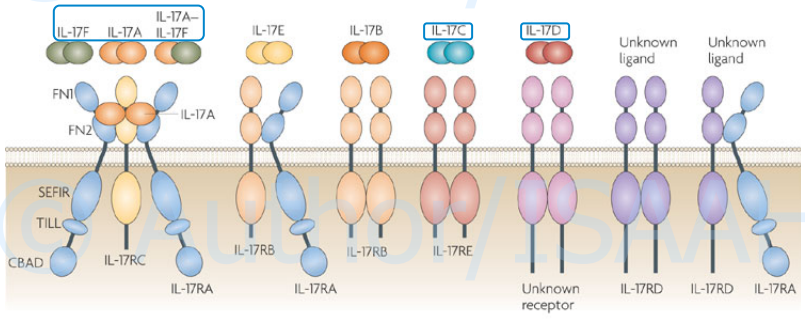
Semi-quantitative analysis

Expression level of IL-17 family genes in organs

- Expression level of IL-17 family genes in intestine stimulated with LPS



- IL-17 receptors isolated from human and teleost



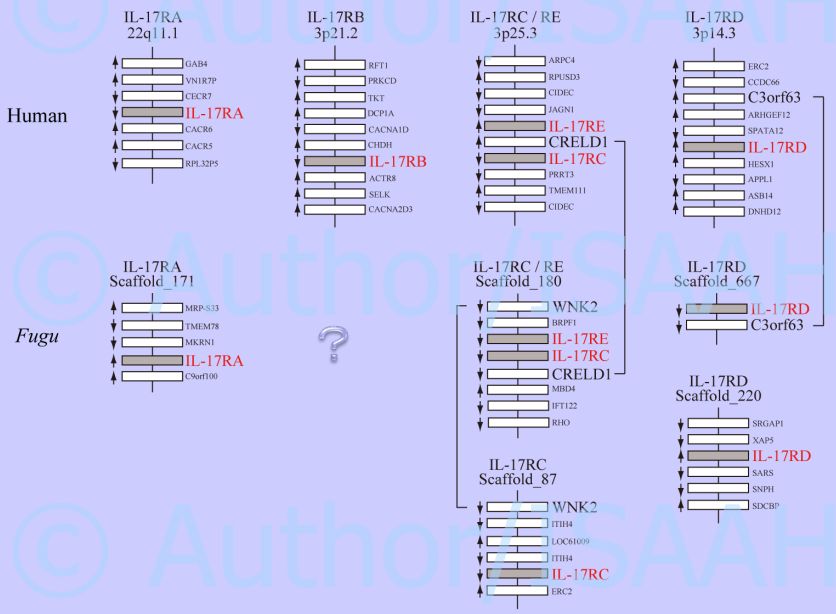
: Ligands isolated in teleost

Nature Reviews| immunology

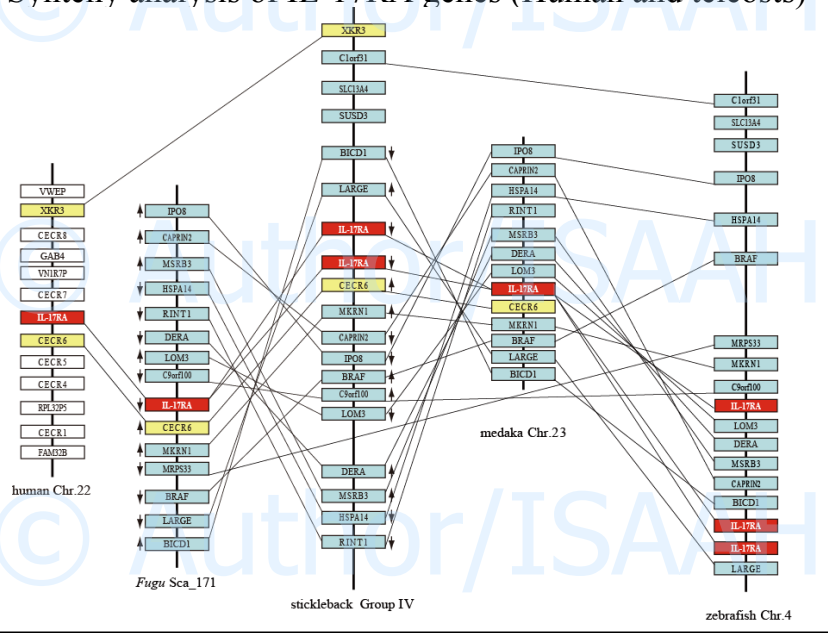
Teleost

IL-17 receptors	*Fish species*
IL-17RA	salmon, trout
IL-17RD	salmon, trout, zebrafish

- Synteny analysis of IL-17 receptor genes (Human and *Fugu*)



- Synteny analysis of IL-17RA genes (Human and teleosts)



- Conclusions -

- IL-17 family genes (A/F-1, 2, 3, C, D, N) were isolated from medaka
- IL-17N might be unique ligand in teleost
- The expression profile of medaka IL-17 family genes in tissues was quite different in each subtype
- Medaka IL-17 family may be involved in immune response because the expression of the genes was increased by the stimulation with LPS
- IL-17RA, RB, RC, RD, RE homologue genes were confirmed on fish genome.