

Table S1. Examples of sequence reads of MHC class II system genes found in single read archive (SRA) datasets published by Malmstrøm *et al.*¹ for Gadiformes and closely related fishes

			MHC II alpha		MHC II alpha (DB category)	MHC II alpha (DE lineage)	MHC II beta		MHC II beta (DB category)	MHC II beta (DE lineage)	CD4		CD74	CD74b
			DA-alpha1	DA-alpha2 (or DB?)*		DE-alpha1	DA-beta1	DA-beta2 (or DB?)*			DE-beta1	DE-beta2		
P a r a c a n t h o d i o p t e r m e g i i	Polymixiiformes	Polymixia japonica	ERR1473839.44330697.3	ERR1473839.20025846.2	ERR1473839.32259465.2	ERR1473839.27534987.1	ERR1473839.22890346.2	ERR1473839.851577.1	ERR1473839.22890346.2	ERR1473839.34239709.1	not found	not found	ERR1473839.30336379.2	ERR1473839.44330697.3
	Percopsiformes	Percopsis transmontana	ERR1473840.53083588.1	ERR1473840.41133348.1	ERR1473840.6904051.2	ERR1473840.17901815.2	ERR1473840.42081275.2	ERR1473840.6515879.1	ERR1473840.7606897.2	ERR1473840.2413803.1	ERR1473840.8212410.2	ERR1473840.43097935.1	ERR1473840.4999384.1	ERR1473840.7941791797.1
		Typhlichthys subterraneus	ERR1473841.18484405.2	ERR1473841.63862862.2	ERR1473841.3636326.1	ERR1473841.51951884.2	ERR1473841.8030952.2	ERR1473841.41889616.1	ERR1473841.29304081.2	ERR1473841.44184621.2	ERR1473841.37010882.1	ERR1473841.51226378.2	ERR1473841.14637889.2	ERR1473841.6033005.2
	Zeiformes	Zeus faber	ERR1473842.37254203.1	ERR1473842.71948405.1	ERR1473842.29847847.1	ERR1473842.34174392.1	not found	not found	ERR1473842.9039530.1	ERR1473842.59103854.2	ERR1473842.54029737.1	not found	not found	ERR1473842.70810363.1
		Cyttopsis roseus	ERR1473843.4908871.2	ERR1473843.36278503.2	ERR1473843.36278700.1	ERR1473843.20707826.2	not found	ERR1473843.64784299.1	ERR1473843.7426387.1	ERR1473843.54084647.1	ERR1473843.7222374.1	ERR1473843.22497005.1	not found	not found
	Stylephoriformes	Stylephorus chordatus	ERR1473844.58880768.1	ERR1473844.60703990.1	not found	not found	not found	ERR1473844.21942590.2	ERR1473844.9747422.1	ERR1473844.79517900.1	not found	not found	not found	ERR1473844.50448772.2
	Bregmacerotidae	Bregmaceros cantori	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
	Merlucciidae	Merluccius polli	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Merluccius merluccius	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Merluccius capensis	ERR1473850.24337900.1	ERR1473850.4305115.2	ERR1473850.25236758.2	not found	not found	not found	ERR1473850.7420787.2	not found	ERR1473850.3457345.2	ERR1473850.36208825.1	not found	not found
	Melanonidae	Melanonus zugmayeri	ERR1473851.14541326.1	ERR1473851.1276178.1	ERR1473851.5331082.1	ERR1473851.34506639.2	ERR1473851.28557328.1	ERR1473851.15069276.1	ERR1473851.14447377.1	ERR1473851.4610054.2	ERR1473851.50708628.1	ERR1473851.3610969.2	ERR1473851.55143933.1	ERR1473851.41782205.1
	Muraenolepididae	Muraenolepis marmoratus	not found	not found	ERR1473853.13332883.1	ERR1473853.33942289.2	not found	not found	not found	not found	not found	not found	not found	not found
G a d i d a e	Trachyrincinae	Trachyrincus scabrus	not found	ERR1473855.24170403.1	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Trachyrincus murrayi	not found	not found	not found	not found	not found	not found	ERR1473859.14595611.1	ERR1473859.569519.1	not found	not found	not found	not found
	Moridae	Mora moro	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Laemonema laureysi	ERR1473862.42883806.1	ERR1473862.20754527.2	not found	ERR1473862.38712638.2	not found	not found	not found	not found	not found	not found	not found	not found
	Bathyganidae	Bathygadus melanobranchus	not found	ERR1473863.1385306.1	not found	not found	ERR1473863.33889778.2	not found	not found	ERR1473863.7278419.2	not found	not found	not found	not found
	Macrourinae	Macrourus berglax	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Malacocephalus occidentalis	not found	not found	not found	not found	not found	not found	ERR1473866.32278967.2	ERR1473866.17837891.1	not found	not found	not found	not found
	Phycinae	Phycis blennoides	ERR1473867.5232893.2	ERR1473869.6894841.1	not found	not found	not found	not found	not found	ERR1473870.508665.2	not found	not found	not found	not found
		Phycis phycis	ERR1473871.51739486.1	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
	Lotinae	Lota lota	not found	not found	not found	not found	not found	not found	ERR1473871.42381912.2	ERR1473871.9123807.1	not found	not found	not found	not found
		Molva molva	not found	not found	not found	not found	not found	not found	ERR1473872.28413271.1	not found	not found	not found	not found	not found
	Gadinae	Brosme brosme	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Trisopterus minutus	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Gadiculus argenteus	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Pollachius virens	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Melanogrammus aeglefinus	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Merlangius merlangus	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Arctogadus glacialis	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Boreogadus saida	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found
		Theragra chalcogramma	not found	not found	not found	not found	not found	not found	ERR1473886.15640894.2	not found	not found	not found	not found	not found
		Gadus morhua	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found	not found

This table shows examples of sequence reads that appear to contain parts of genomic sequences of MHC class II system genes indicated in the upper row and were deposited in the SRA database of NCBI (<https://www.nih.gov/>) by Malmstrøm *et al.*¹ for the species (-clades) indicated in the left columns. The sequence clones were found by "tblastn" analysis using appropriate search sequences, after which gene identity was confirmed by additional sequence comparisons. MHC class II searches were done separately for each of the domains alpha-1, alpha-2, beta-1 and beta-2, of the classical plus classical-related class II lineage DA, the nonclassical class II category DB, and the nonclassical class II lineage DE (for explanation of DA versus DB and DE see supplementary text S1 and reference²). Only one matching sequence read per search is shown, but in most cases sequence reads of more than one matching clone were found. The amino acid sequences encoded by the listed SRAs are shown in Figure S1, where they are aligned with representative sequences of the respective category. *Because the sequence reads are only short (~150 nt) and the Ig-like domain regions are relatively well conserved between the DA and DB categories of MHC class II, for SRAs matching to MHC class II alpha-2 or beta-2 domains we probably can't reliably distinguish between DA or DB identity; DE lineage Ig-like domain sequences have more pronounced distinguishing features (see Fig. S1). In the on-line correspondence section of a previous article by this research group³ we already discussed that it might need more evidence before concluding that the non-canonical CD4-1 sequence in Atlantic cod is a pseudogene; regardless of whether the Atlantic cod *CD4-1* sequence produces a functional protein, with their current data Malmstrøm *et al.*¹ should have deduced the evolution from consensus CD4-1 in a non-gadiform ancestor to the gene forms found in Gadiformes. Examples of matching sequence reads are described in yellow fields, while white fields with "not found" represent negative findings.

References:

- Malmstrøm, M. *et al.* Evolution of the immune system influences speciation rates in teleost fishes. *Nat. Genet.* **48**, 1204-1210 (2016).
- Dijkstra, J.M. *et al.* Comprehensive analysis of MHC class II genes in teleost fish genomes reveals dispensability of the peptide-loading DM system in a large part of vertebrates. *BMC Evol. Biol.* **13**, 260 (2013).
- Star, B. *et al.* The genome sequence of Atlantic cod reveals a unique immune system. *Nature* **477**, 207-210 (2011).