

Molecular Cytogenomics in Vertebrates

Radka Symonová
radka.symonova@gmail.com

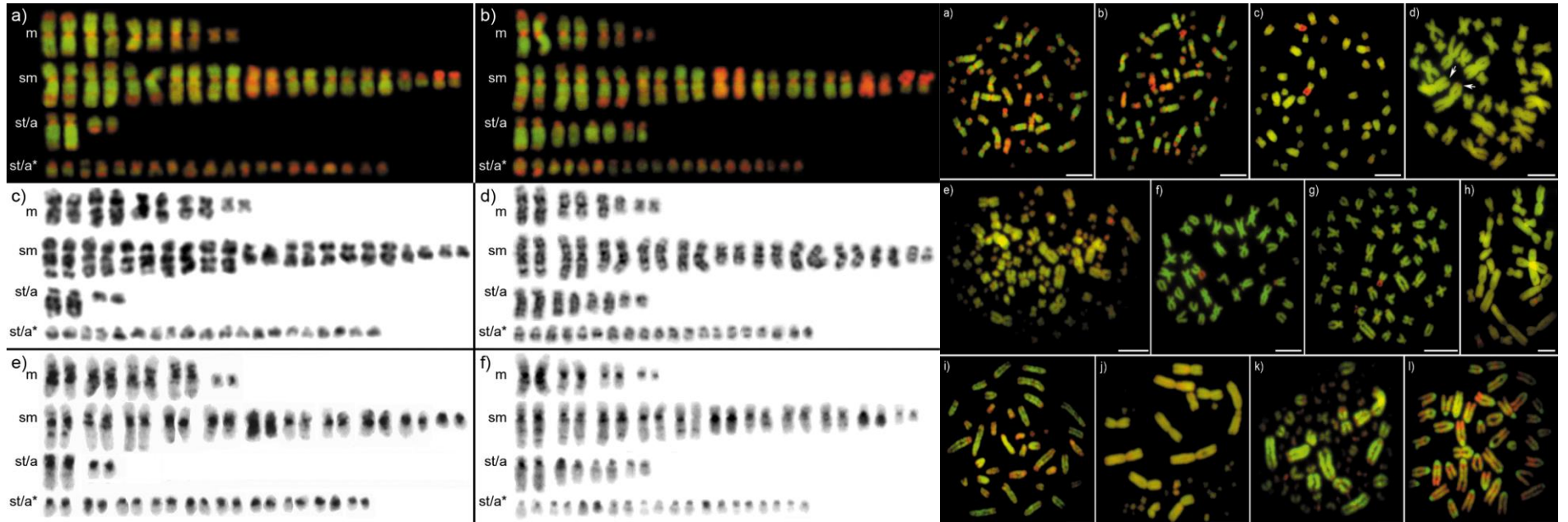


This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 754462

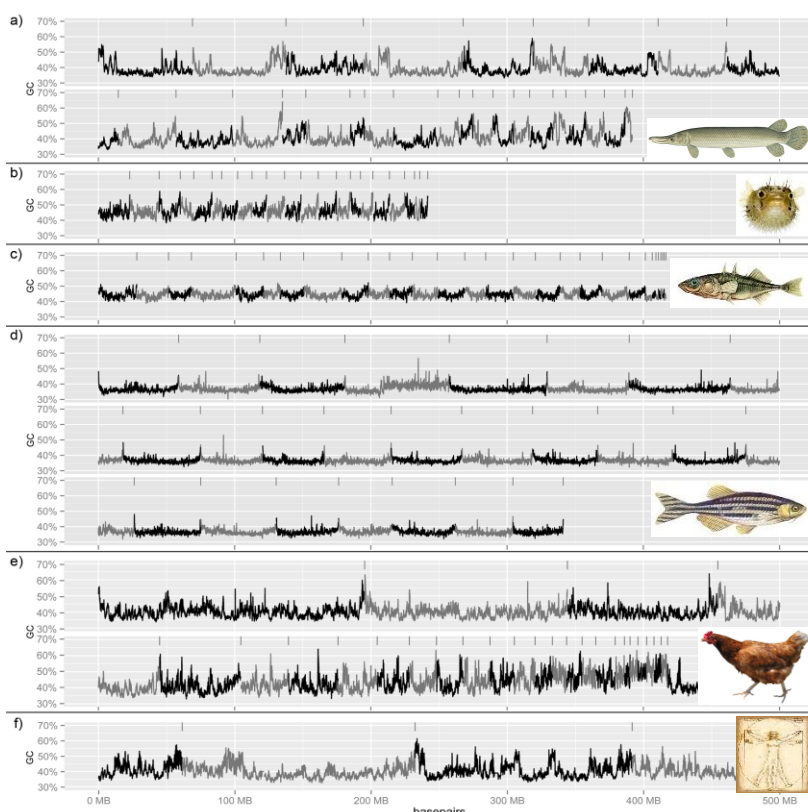
Technical University
of Munich



Cytogenomic analyses in both of two gar genera have uncovered a pattern uncharacteristic for fish and generally for cold-blooded and anamniote vertebrates. The bioinformatic analysis has confirmed a remarkable level of genome AT/GC heterogeneity in spotted gar and revealed a gene richness in the GC-rich regions. This indicates a rather mammalian way of compositional organization of gar genomes. Bioinformatic comparisons exposed that the genome organization of the gar is in fact closer to the mouse and human than to the zebrafish.

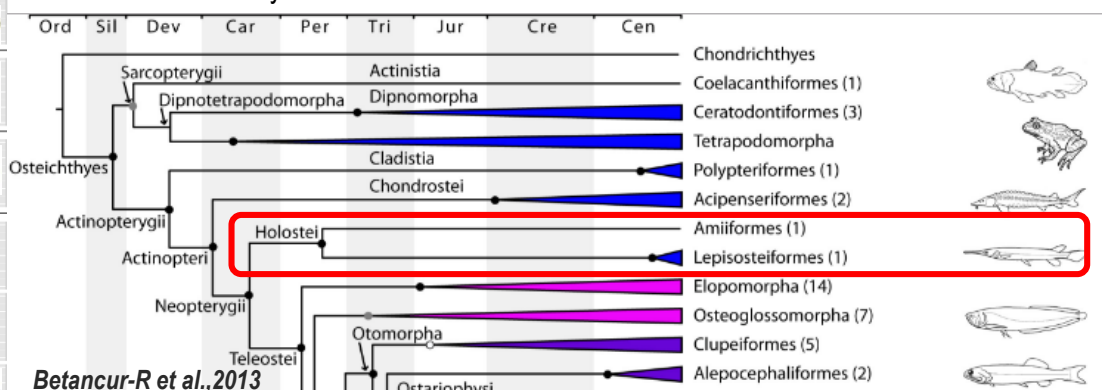


Chromosomes stained with **GC-specific CMA3** and **AT-specific DAPI**: a) tropical gar + b) spotted gar both panels; right panel: c) bowfin; d) bichir; e) sturgeon; f) eel; g) roach; h) frog; i) rapid racerunner; j) green anole; k) chicken and l) mouse; left panel: G-banding pattern c)-d) and C-banding e)-f) in both gar genera

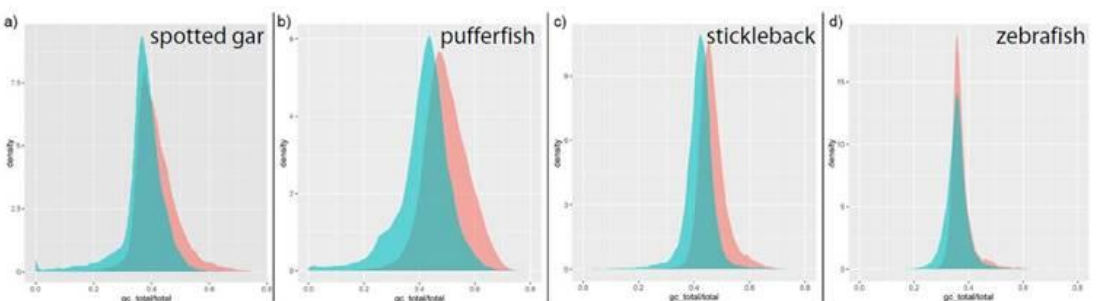


GC profiles along linkage groups, only partial profile shown for human, the panel f). (Symonová et al., 2017)

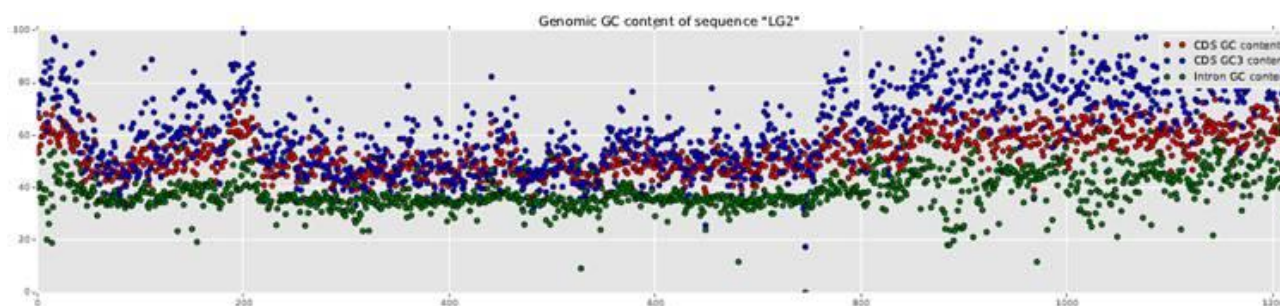
Gars and the bowfin are living fossils and represent a deeply-rooted archaic lineage of non-teleost ray-finned fishes and the only survivors of an early radiation once highly diversified and widely distributed.



Betancur-R et al., 2013



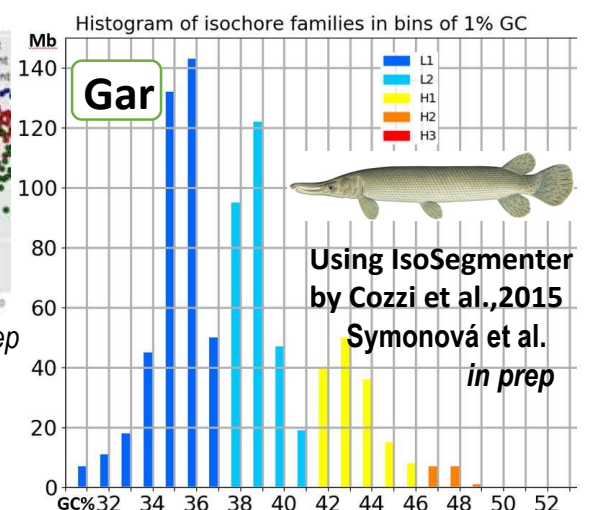
GC content in genes and intergenic regions. Density plots showing GC content in genes (pink) and intergenic regions (green), Symonová et al., 2017



Spotted gar, GC(3)% of linkage group 2, GC% of CDS, GC3% of CDS, introns GC%, Symonová et al. *in prep*

More details: Symonová R, et al. 2017. Genome Compositional Organization in Gars Shows More Similarities to Mammals than to Other Ray-Finned Fish. *J Exp Zool B* 328(7):607-619

Majtánová Z, Symonová R, et al. 2017. "Holostei versus Halecostomi" Problem: Insight from Cytogenetics of Ancient non-Teleost Actinopterygian Fish, Bowfin *A. calva*, *J Exp Zool B* 328(7):620-628



Gar

Using IsoSegmenter
by Cozzi et al., 2015
Symonová et al.
in prep