

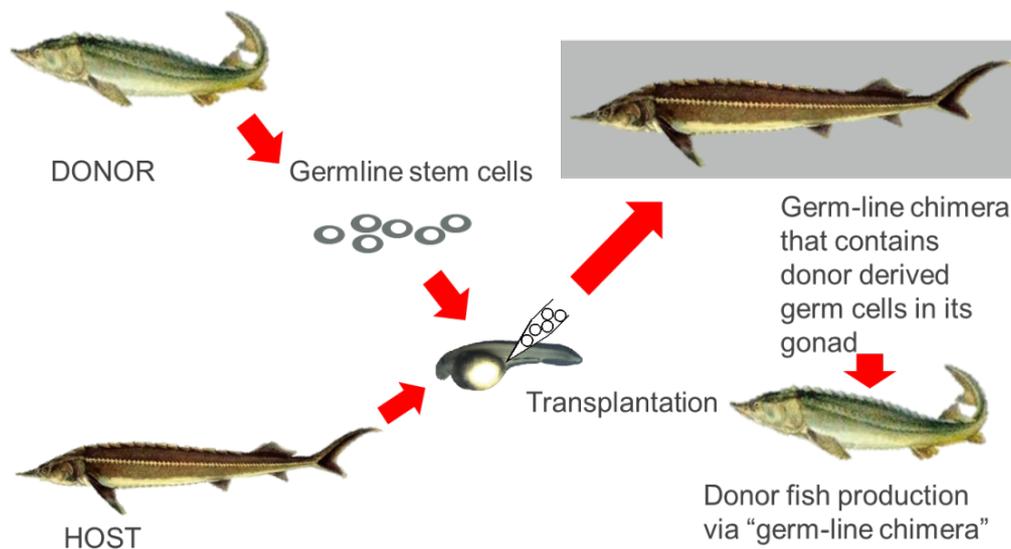
Conserving archaic giants

By Abdul Rasheed Baloch

Sturgeon are living fossils. These dinosaur-like fish swim along the bottoms of lakes, rivers and oceans searching for food, just as they have for millions of years.

Unfortunately, the International Union for Conservation of Nature (IUCN) lists 16 out of 27 species of these archaic giants as critically endangered meaning these species are on the verge of extinction. Leading causes for their population decline include over fishing for caviar and construction of dams.

The long sturgeon reproductive cycle makes conservation strategies difficult. For this reason, there is a need to quickly develop improved and efficient methods such as surrogate production in fish – an amazing feat for scientific communities in fisheries and aquaculture. Use of surrogate production technology, especially for endangered fish species is truly astounding. However, in case of sturgeon, it leaves question how to prepare a sterilized host (sterlet; *Acipenser ruthenus*) for surrogacy having short reproductive cycle.



Triploidization or hybridization are commonly used sterilization techniques in fish. Since they have not been authenticated in sturgeon, antisense morpholino oligonucleotide have been used. These synthetic molecules are expensive and toxic to cells. To prepare host, our project uses CRISPR/Cas9, a cutting-edge genome editing technology, to target the *dnd1* gene in order to sterilize sterlet host. Once the host is sterilized, germ stem cells from critically endangered sturgeon species will be transplanted into the sterlet (see illustration).

This is the first study of its kind where gene editing is done in sturgeon. Surrogacy in sturgeon will provide a glimmer of hope because it will increase the number of these large fish with their long reproductive cycle over a short period of time. In this way, these archaic giants will have another opportunity to roam in waters of the world, especially in European rivers.



[Simpleshow video - https://vimeo.com/288688280](https://vimeo.com/288688280)

Conservation of huge sturgeon will have a positive impact on communities as their eggs – a salty snack better known as caviar – will again be available at a reasonable price while no longer imperiling the population.