

## Fra toppen!

### Værforhold og logistikk

En relativt rolig uke er passert, der mange har tatt en velfortjent vinterferie for å nyte snø og stille dager. En vellykket ferie avgjøres av to vesentlige faktorer: værforhold og logistikk. Det samme gjelder forøvrig på andre områder av vår virksomhet, som tokt og feltarbeid.

Selv ble jeg rammet av begge deler da jeg besøkte Ski-VM i Oslo forrige helg. Logistikken var som på en syd-italiensk vitenskapelig konferanse, og tåken lå tjukk som en granskog, med et siktedyp på knappe fem meter. Marit Bjørgens gull fikk vi se på TV om kvelden.

SFF-utlysningen kom også denne uken, med søknadsfrist 8. juni. Med god logistikk og litt bedre hell med værforholdene kan vi kanskje håpe på gull her også.

Hilsen Anders



### Ukens bilde



### Adult brachiopod

Photographer: Andreas Hejnol

Adult female brachiopod *Terebratalia transversa*. The shell has been opened, the gravid gonads (orange) are visible. The brachiopod plays the lead role in this week's news story about photoreceptor evolution. See p. 6.

You are invited to submit photos (electronically!) for "Ukens bilde". Please include a very short description and credit information. Picture can be of researchers / students in action, technology, organisms, field sites ... Please send your pictures to [bio.info@bio.uib.no](mailto:bio.info@bio.uib.no)

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### Siste nytt fra verden rundt oss

Oppsiktsvekkende om evolusjon av fotoreseptorer fra Sars; Nytt akademisk norsk-japansk alumninettverk; Nyhetsbrev fra Norecopa; Available positions: Research Fellow in biosystematics (Tromsø); 11 postdocs + 16 PhD stillinger utlyst ved MOF

#### "A swimming eyeball": Simple marine animals use a type of photoreceptors identical to that used by humans

A photoreceptor similar to that used by humans was found in a simple marine invertebrate larva. Previously thought to be unique to animals with a backbone (such as fish, birds and mammals) a ciliary photoreceptor has been surprisingly found to be used by a much simpler invertebrate animal for directional vision. The finding implies that the usage of old cell types for similar functions is much more common and flexible than previously thought. The gene that is responsible for patterning this photoreceptor (a specific type of ciliary Opsin) is even expressed much further in a developmental stage that is phototactic although it has no eyes.

Now, in research published online in the Open Access Journal "EvoDevo", an international team that includes researcher from the Uni Sars Centre for Marine Molecular Biology in Bergen, the Museum of Natural History in Berlin and the University of Hawaii have shown that the photoreceptor type used in humans is also used in brachiopods, which are present on the earth since the early Cambrium.

Using gene expression and ultrastructural methods they found the same photoreceptor as in humans. This implies that the last common ancestor of both animals might have used the same type of photoreceptor for vision or that this ancestral cell type was reused like a "tool" several times independently in different animals.

Brachiopods are sessile animals as adults, but are very agile swimmers already as early developmental stages. As planktonic organisms they swim to the water surface where the light is more intense. Using behavioral experiments the team of researchers have found that the early stages that not even possess eyes, are phototactic using most likely the photoreceptive protein that is already expressed in the cells. Dr. Andreas Hejnol, scientist at the Sars International Centre for Marine Molecular Biology and scientist of the team said: "This early developmental stage called "gastrula" can be seen as a 'swimming eyeball' that is able to find the sunny surface of the ocean".



Larva with red-eyespot that contain ciliary photoreceptors.

Scientists studied the fine morphology and detected a cellular "appendage", a cilium in both photoreceptor cells forming each larval eye. These modified cilia are the active components of the brachiopod eye that contains even a lens. "Expecting a completely different morphology, we were absolutely surprised to discover a ciliary photoreceptor in these brachiopod larvae", said the German co-author Carsten Lüter from the Museum of Natural History, Berlin. Mapping the expression of genes that are specific to this cell type, the scientists got evidence for the high conservation of this cell over 500 million of years.



Gene expression of ciliary-Opsin in different developmental stages of the brachiopod *Terebratalia transversa*. All stages are swimming and show phototactic behaviour Gastrula (top), late gastrula (mid), larva (bottom, and below).





Lead authors of the EvoDevo article: Yale Passamaneck (Hawaii, USA), Carsten Lüter (Berlin, Germany), Andreas Hejnlol (Sars, Norway).

The results show that the common ancestor of flies, brachiopods and humans most likely had already eyes that used this photoreceptor for vision - either just to detect light - e.g. the lunar cycle, or even for detecting the direction of light sources. Regarding the work, Dr. Passamaneck, the Hawaiian co-author of the study, said, "This research provides a new model for understanding the very earliest stages of eye evolution, how simple cells on the surface of an animal could become able to respond to light, and how these simple cells could be connected to eventually form something as complex as the human eye."

Research group leader at the Uni Sars Centre in Norway, Andreas Hejnlol said: "Our studies on unusual marine animals shows again that we can learn a lot about human natural history from studying the animal diversity in the oceans."

The research article, entitled "Ciliary photoreceptors in the cerebral eyes of a protostome larva", is published online this week (March 1, 2011) in the Open Access journal EvoDevo (<http://www.evodevojournal.com/content/2/1/6/abstract>).

See also news article in New York Times and blog in Discovery Magazine:

New York Times: [http://www.nytimes.com/2011/03/01/science/01eyeball.html?\\_r=3&ref=science](http://www.nytimes.com/2011/03/01/science/01eyeball.html?_r=3&ref=science)

Discovery Magazine: <http://blogs.discovermagazine.com/loom/2011/03/01/a-swimming-eyeball/>

### **Nytt akademiske norsk-japanske alumninettverket - [NorAlumni Japan](#)**

On February 8, 2011, the new academic network **NorAlumni/Japan** was launched by the Norwegian Minister of Research and Higher Education, Ms. Tora Aasland.

NorAlumni was developed and will be maintained cooperatively by the Research Council of Norway and Innovation Norway, with the support of Norwegian consulates and embassies, the Norwegian Association of Higher Education, the Federation of Norwegian Industries, Abelia, and Norwegian business associations worldwide.

NorAlumni is a academic network aiming at connecting **students, researchers, teachers and scholars** with Norwegian-Japanese relations.

There are now 71 members from Japanese and Norwegian universities, research organisations and other institutions.

Members may: