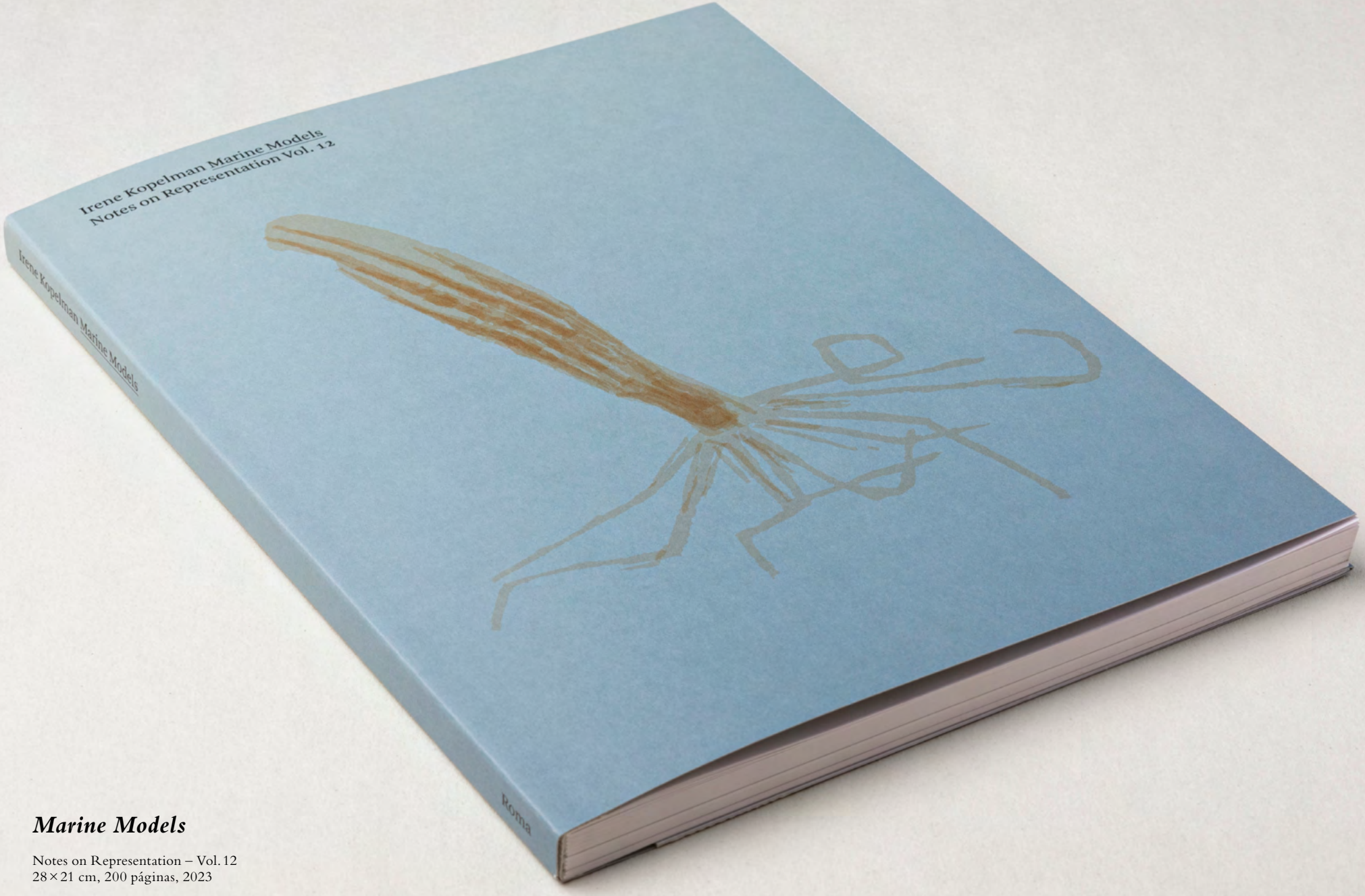

Marine Models

Notes on Representation – Vol. 12
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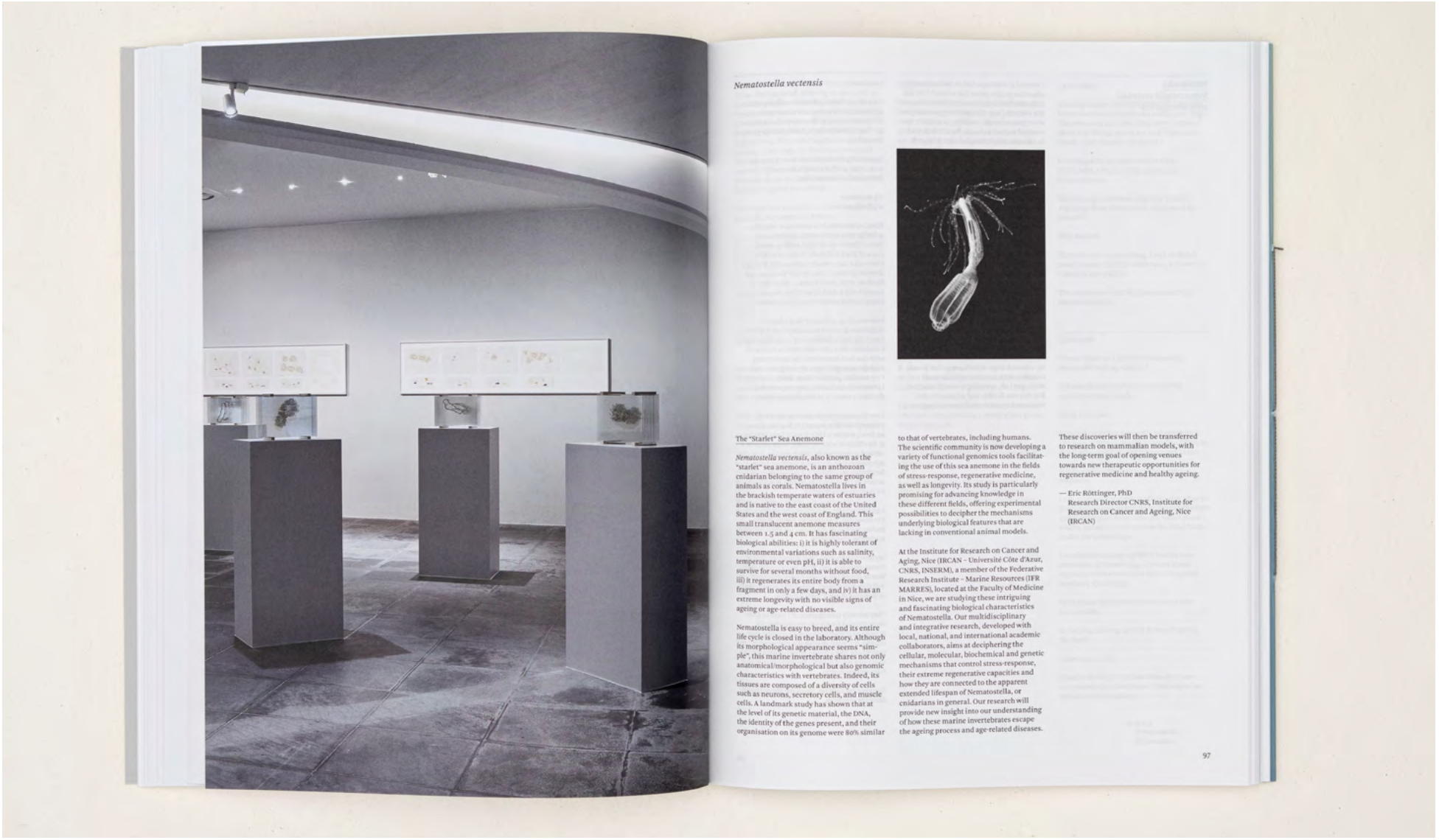

Nematostella vectensis

The "Starlet" Sea Anemone

Nematostella vectensis, also known as the "starlet" sea anemone, is an anthozoan cnidarian belonging to the same group of animals as corals. Nematostella lives in the brackish temperate waters of estuaries and is native to the east coast of the United States and the west coast of England. This small translucent anemone measures between 1.5 and 4 cm. It has fascinating biological abilities: i) it is highly tolerant of environmental variations such as salinity, temperature or even pH, ii) it is able to survive for several months without food, iii) it regenerates its entire body from a fragment in only a few days, and iv) it has an extreme longevity with no visible signs of ageing or age-related diseases.

Nematostella is easy to breed, and its entire life cycle is closed in the laboratory. Although its morphological appearance seems "simple", this marine invertebrate shares not only anatomical/morphological but also genomic characteristics with vertebrates. Indeed, its tissues are composed of a diversity of cells such as neurons, secretory cells, and muscle cells. A landmark study has shown that at the level of its genetic material, the DNA, the identity of the genes present, and their organisation on its genome were 80% similar to that of vertebrates, including humans. The scientific community is now developing a variety of functional genomics tools facilitating the use of this sea anemone in the fields of stress-response, regenerative medicine, as well as longevity. Its study is particularly promising for advancing knowledge in these different fields, offering experimental possibilities to decipher the mechanisms underlying biological features that are lacking in conventional animal models.

At the Institute for Research on Cancer and Aging, Nice (IRCAN – Université Côte d'Azur, CNRS, INSERM), a member of the Federative Research Institute – Marine Resources (IFR MARRES), located at the Faculty of Medicine in Nice, we are studying these intriguing and fascinating biological characteristics of Nematostella. Our multidisciplinary and integrative research, developed with local, national, and international academic collaborators, aims at deciphering the cellular, molecular, biochemical and genetic mechanisms that control stress-response, their extreme regenerative capacities and how they are connected to the apparent extended lifespan of Nematostella, or cnidarians in general. Our research will provide new insight into our understanding of how these marine invertebrates escape the ageing process and age-related diseases. These discoveries will then be transferred to research on mammalian models, with the long-term goal of opening venues towards new therapeutic opportunities for regenerative medicine and healthy ageing.

— Eric Röttinger, PhD
Research Director CNRS, Institute for Research on Cancer and Ageing, Nice (IRCAN)

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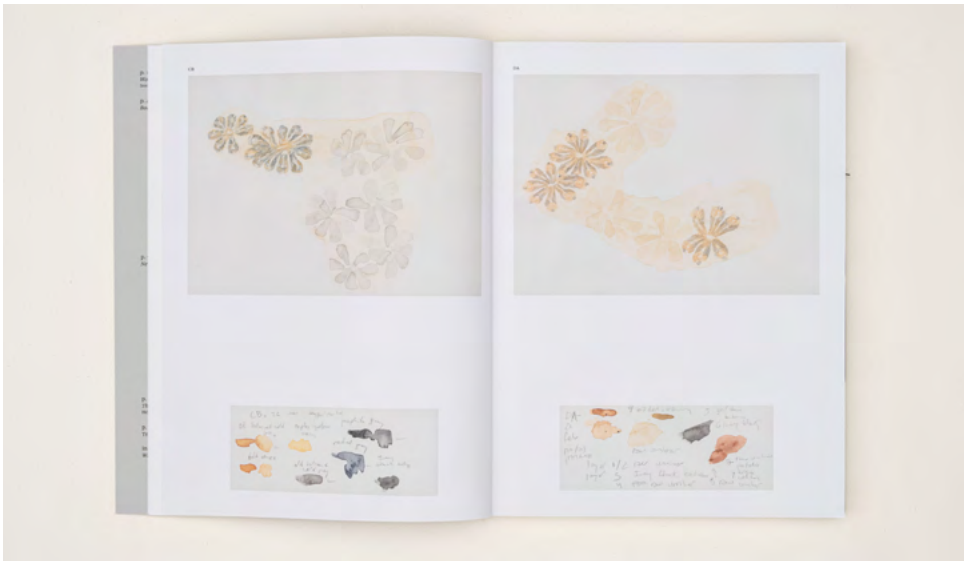
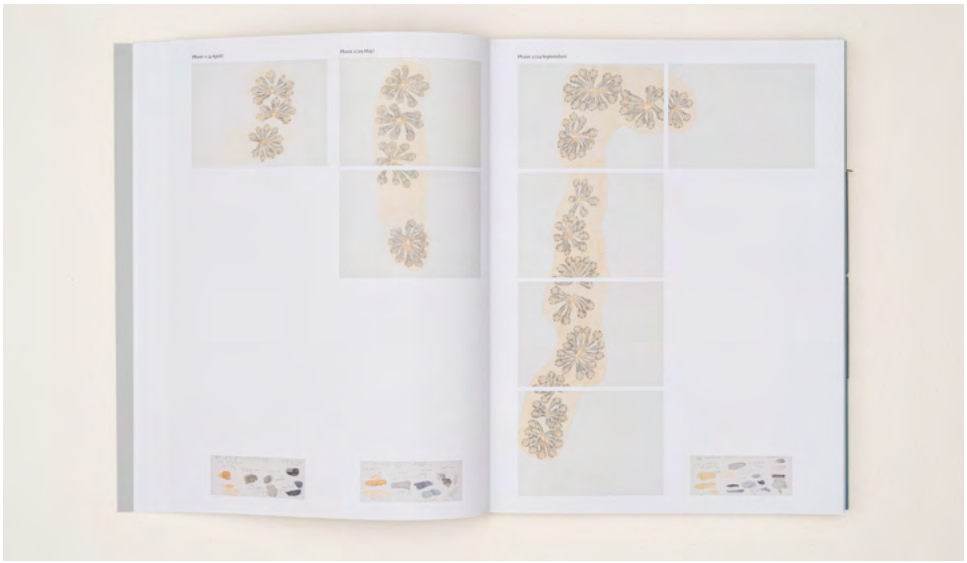
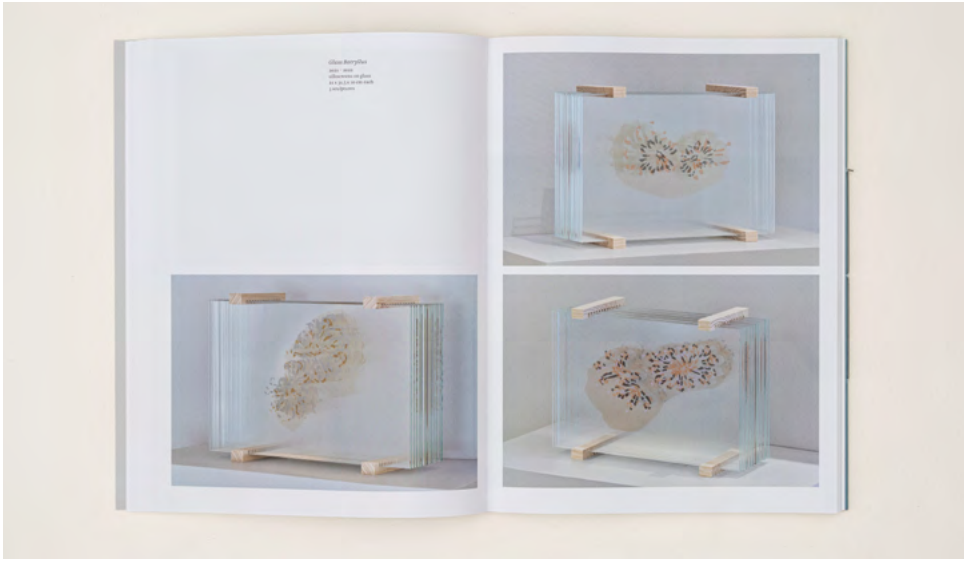
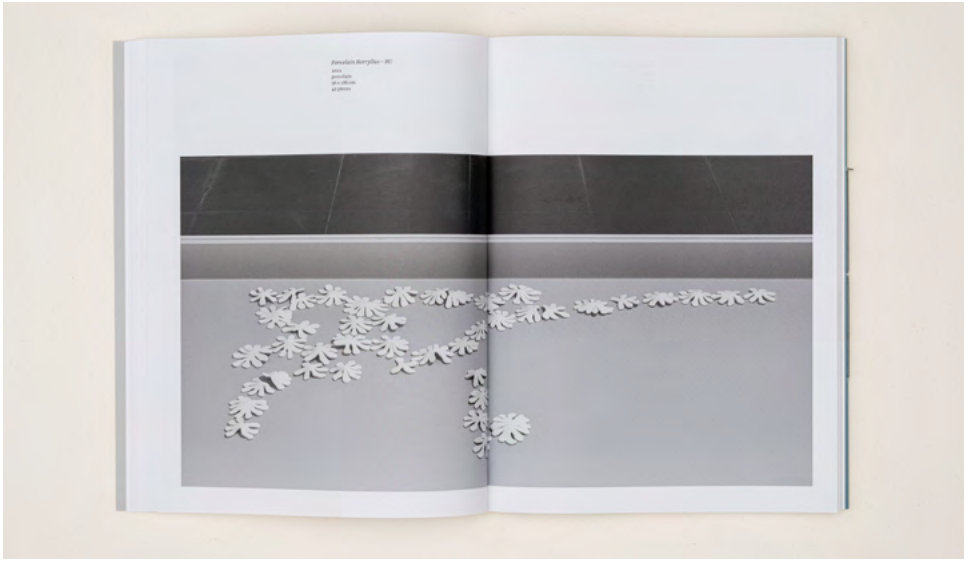
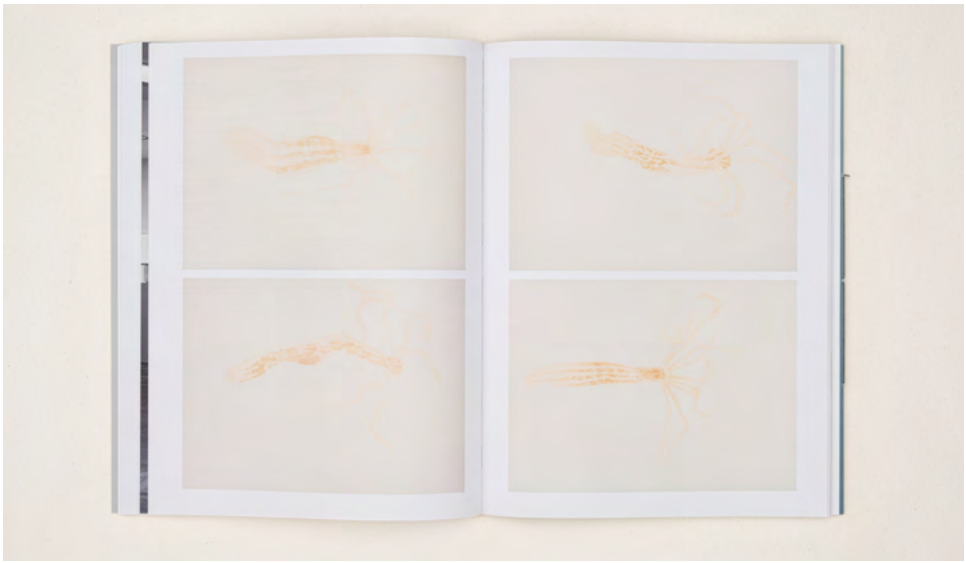
En colaboración con científicos del Institut de la Mer de Villefranche y del Instituto de Investigación sobre Cáncer y Envejecimiento en Niza, Irene Kopelman trabajó con dos pequeños animales marinos: *Botryllus schlosseri* y *Nematostella vectensis*. Uno de ellos es colonial y el otro es solitario, pero ambos poseen la extraordinaria capacidad de regenerar todo su cuerpo, un proceso conocido como 'desarrollo no embrionario'. Para la artista, el acto de dibujar es una forma de pensar y procesar lo que observamos mediante una actividad material y física: detenerse en un tema, explorarlo a través de la mirada y profundizar en el aprendizaje.

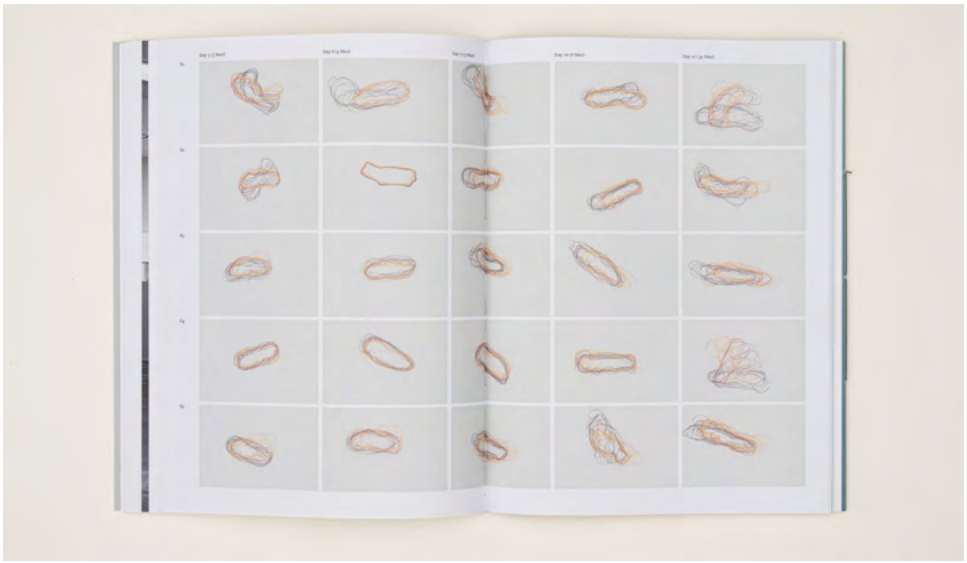


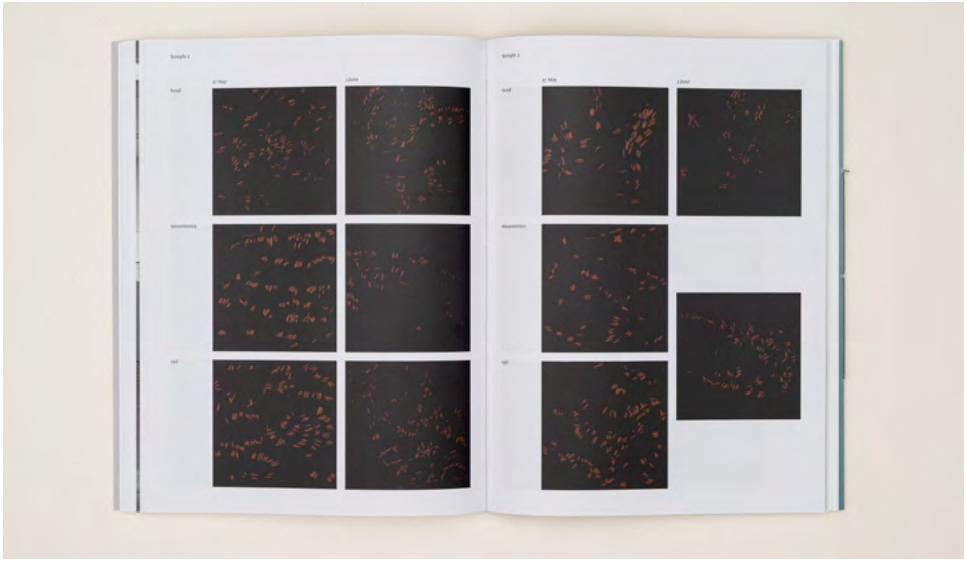


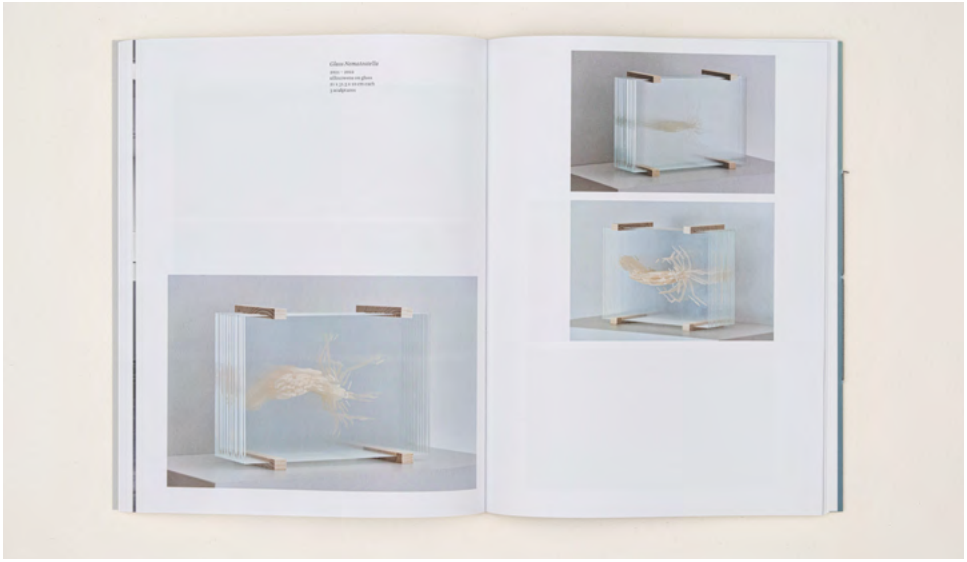


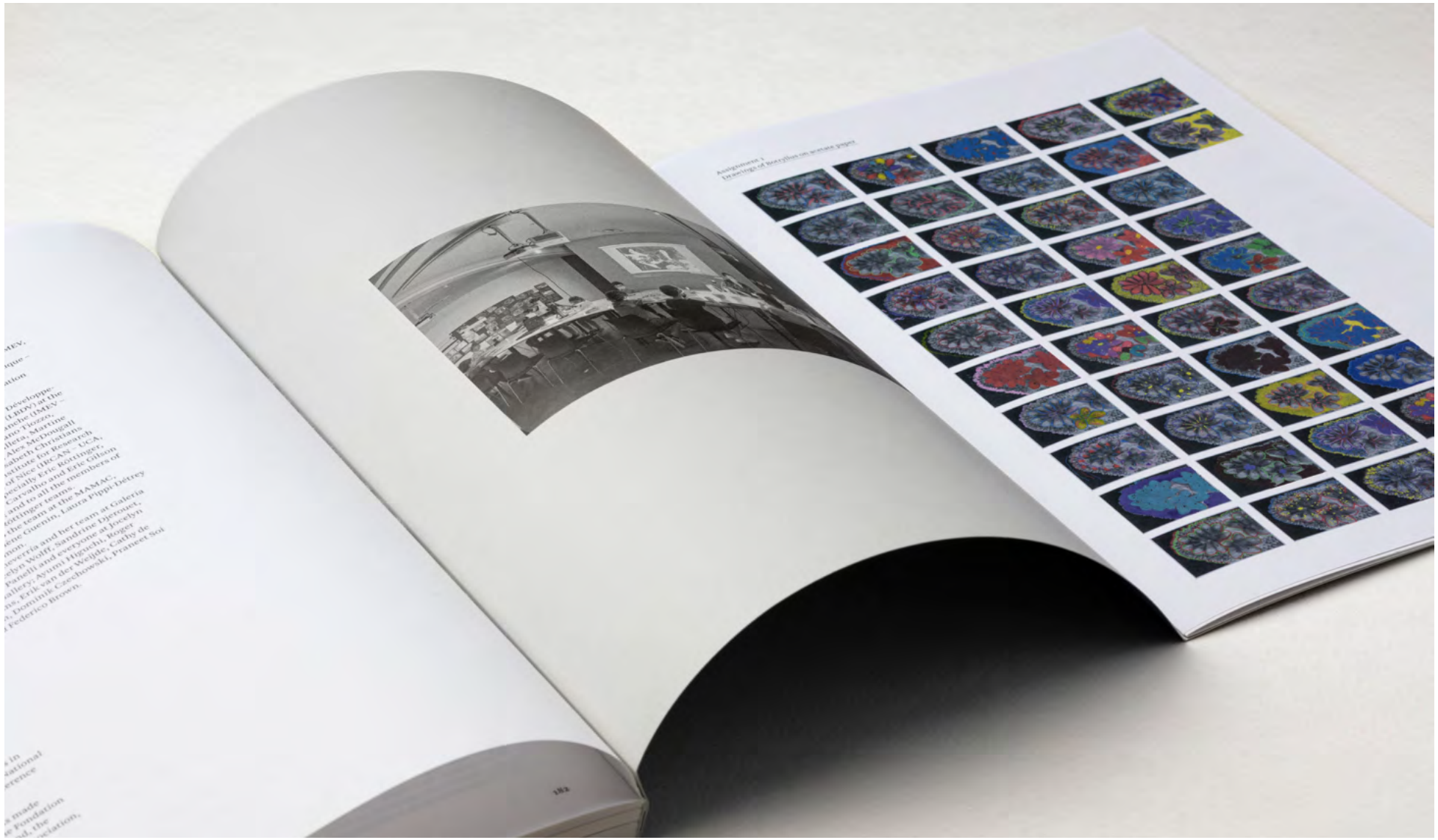












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