



## Cutaneous Mosaic Disorders Nevi & Nevoid Skin Disorders and Complex Vascular Malformations and Vascular Tumours

### Introduction to DNA and genes

DNA is a code in all living things, including people (Fig. 1). The code is a set of instructions for how to build the living thing, or how to build a person. The instructions are divided up into GENES, which are like words in the code (Fig. 2). We inherit our genes from our parents, and the mixture of those genes makes us who we are (Fig.3).



Fig. 1: DNA helix



Fig. 2: genes are like words in the code

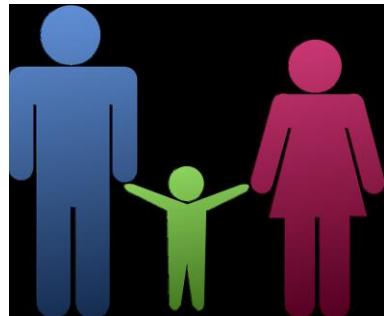


Fig. 3: we inherit our genes from our parents

### Introduction to genes and mutations

Mistakes can happen in a gene, like a spelling mistake in any instruction (Fig. 4). A mistake in a gene is called a mutation, which can lead to a change in how the new person is made. In many genetic diseases, a mistake in a gene is inherited from the parents, but in mosaicism the genes from the parents do not carry mistakes (Fig. 5).



Fig. 4: mutations are like spelling mistakes in an instruction

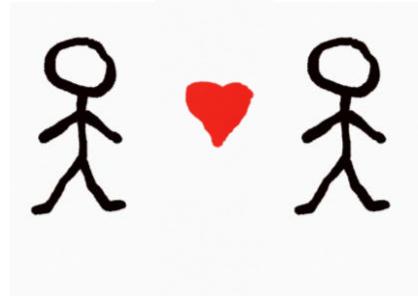


Fig. 5: In mosaicism we do not inherit our parents' mistakes.

## What is mosaicism?

Mosaicism is having a mistake in a gene, which has happened to the baby when it is developing in the womb. The mutation therefore does not affect the whole baby, but just a part of it – like a “mosaic” of two different colours (Fig. 6). When the mutation affects the skin, we see it as a birthmark (Fig. 7).

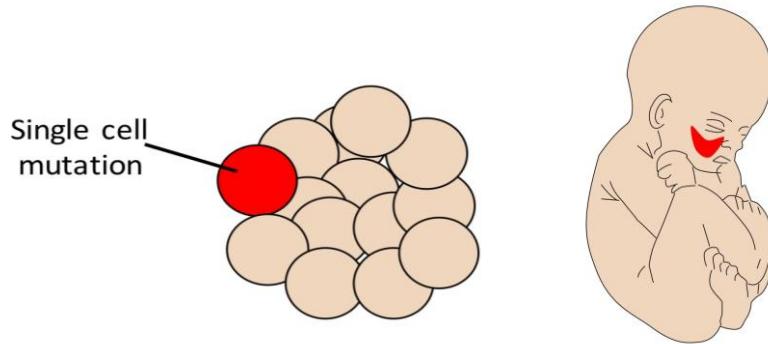


Fig. 6: mutation in a cell of an embryo

Fig. 7: birthmark in embryo due to a mutation

## What is the consequence for the patient?

Mosaicism may lead to several diseases. They range from mild to severe conditions that may involve internal organs (Fig. 8). The principal category of mosaicism is:

- a) Vascular anomalies
- b) Congenital melanocytic naevi
- c) Epidermal nevi
- d) Complex syndromes with multiple component

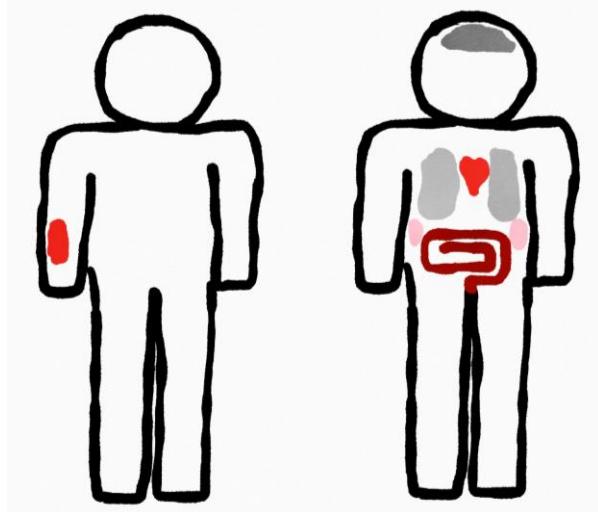


Fig. 8: Consequences may range from a patch on the skin to involvement of several internal organs.

## Is there a risk of passing from the patient to offsprings?

In general, the risk of passing to offsprings is very low and mosaicism are sporadic (Fig. 9). Ask to your doctor for further information (Fig. 10).

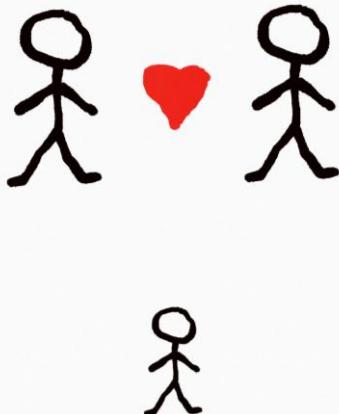


Fig. 9: the risk of passing mutations from a person affected with a mosaic to offsprings is negligible

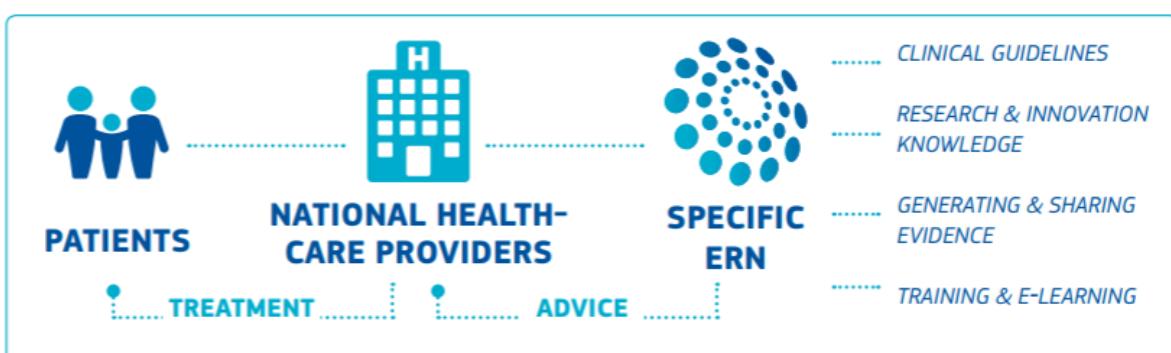


Fig. 10: the Doctor will give you further information on the risk of passing the mutation

## The European Reference Networks (ERNs)

The European Reference Networks (ERNs) gather doctors and researchers with high expertise in the fields of rare or low-prevalence and complex diseases. They are “virtual networks” which discuss the diagnosis and the best possible treatment for patients from all over Europe. 24 ERNs were launched in 2017, involving more than 900 highly specialised healthcare teams, located in more than 300 hospitals in 26 European countries.

Among the ERNs, ERN-Skin specifically has the aim to improve the quality, safety and access to highly specialized healthcare providers for rare, low prevalence and undiagnosed skin disorder.



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