Cutaneous mosaicism

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The most frequently occurring category is non-segmental mosaicism, including single point mosaicism (solitary nevi), disseminated mosaicism (hereditary skin tumors), and patchy pattern without midline separation (large melanocytic nevi). – In the group of segmental mosaics, we distinguish different patterns such as the lines of Blaschko, the flag-like pattern, the phylloid pattern, and the lateralization pattern. There are different mechanisms giving rise to segmental mosaicism. The group of lethal autosomal mutations surviving as moaics has substantially increased during the past years: nevus comedonicus syndrome (*NEK9*), encephalocraniocutaneous lipomatosis (*FGFR1*), linear hypomelanosis with segmental megalencephaly (*MTOR*), Becker nevus syndrome (*ACTB*), and Vabres syndrome (*RHOA*). – Examples of type 1 segmental mosaicism in autosomal dominant disorders include epidermolytic ichthyosis of Brocq, erythrokeratodermia symmetrica et progressive (= erythrokeratodermia variabilis et progressiva), tuberous sclerosis, neurofibromatosis 1, and many other phenotypes. – The concept of type 2 segmental mosaicism of autosomal dominant skin disorders has now been proven at the molecular level in many traits including Hailey-Hailey disease, Darier disease, neurofibromatosis 1, Legius syndrome, Gorlin syndrome, PTEN hamartoma syndrome, and hereditary osteomatosis cutis. – In common skin disorders with a polygenic background such as psoriasis or vitiligo, the n+1 rule can explain cases of pronounced segmental involvement being super imposed on the ordinary non-segmental lesions. – A growing field of knowledge is epigenetic mosaicism that explains segmental patterns occurring in X-linked, male-lethal disorders as well as in X-linked, non-lethal disorders. A new X-linked, male-lethal phenotype is terminal osseous dysplasia with pigmented skin defects. – Moreover, epigenetic autosomal mosaicism will soon become an established concept in human skin diseases. – Cases of revertant mosaicism, especially in severe forms of epidermolysis bullosa, gain increasing attention and may be used as a model fo the development of new approaches of gene therapy.