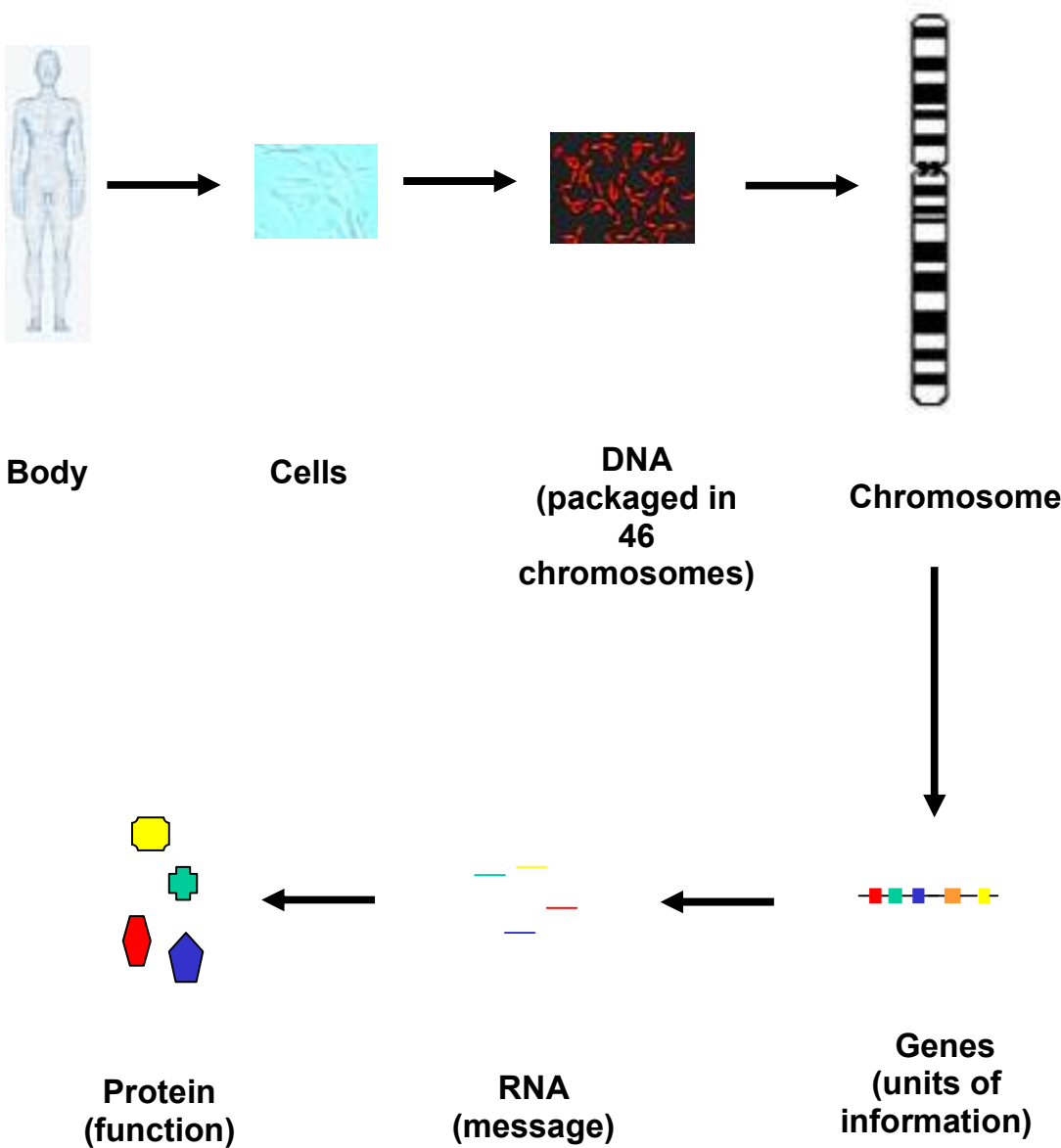


PROTEUS SYNDROME RESEARCH UPDATE

First a biology recap/primer:



Everybody is made up of millions of cells. All the information required to make a body is found in DNA, which is packaged in chromosomes found in the nucleus. This information is found in many units known as genes. RNA is the messenger for each gene, which then causes a protein to be made in the cytoplasm of the cell. (Analogy – the nucleus is the library, DNA is a cookery book, one gene is equivalent to the pages for one individual recipe, RNA is equivalent to a photocopy of the recipe, which is taken to the kitchen (cytoplasm) where the dish is made (protein). Different cells need different proteins, so don't use all the genes just those required. The genes used depend on the cell type.

The information in a gene is in a code represented by letters eg:

Normal gene:

ATG CAG CAT GAA CCC GTG

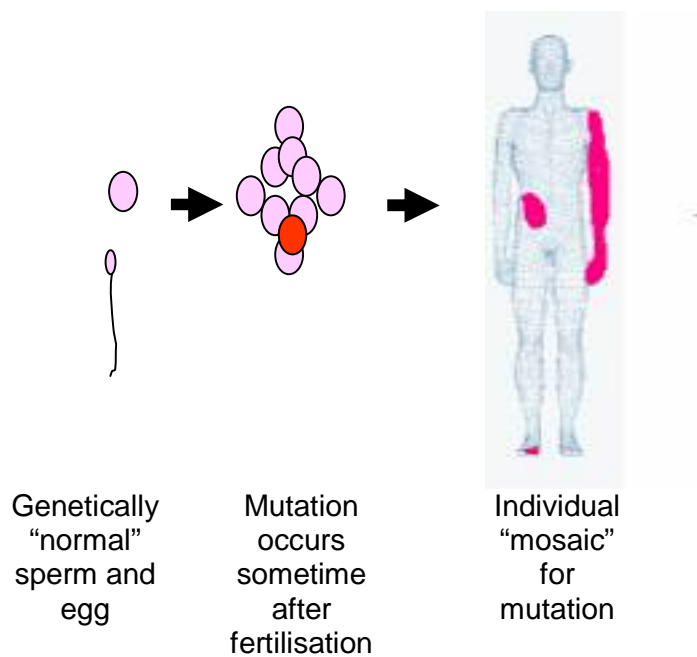
Mutant gene:

ATG CAG CAT **T**AA CCC GTG

If one of the letters changes this can be a mutation and this means that the protein may be wrong and will not function as it should. Analogous to using salt instead of sugar in a cake!

There are other types of mutation eg losing large parts of a gene analogous to losing a large portion of the recipe.

Proteus syndrome – probable events



This is the most favoured explanation for proteus. As individuals are affected in a mosaic manner it is thought that the "mutation" is not present in all cells and that fertilization occurs between a normal sperm and normal egg. Early in development one cell undergoes a mutation and subsequently only the cells and tissues that arise from that cell are affected.

Published research:

Because proteus is rare, sporadic and mosaic it makes determining the cause a difficult challenge.

There are a few reports in the literature of chromosomal abnormalities detected in proteus cases, but these are different in each report and as yet no gene in any region has been implicated.

There are a couple of published cases of a mutations in a gene known as PTEN in proteus or proteus like syndromes, but several other reports NOT finding PTEN mutations.

NIH RESEARCH

Les Biesecker is researching the cause of proteus; so far he has not found PTEN mutations or not published any positive findings.

COLD SPRING HARBOUR RESEARCH

At the NIH proteus family meeting last year Eli Hatchwell presented data that he had identified a region of DNA that was lost in 3 of 5 proteus patients but has not yet published anything on this.

SUTTON RESEARCH

Simon Hughes in Richard Houlston's group has performed some preliminary experiments similar to those presented by Eli Hatchwell but has not found anything conclusive. There is a gene that is sometimes found mutated in Klippel-trenaunay syndrome, I have screened for the common mutation. I have found one sequence change in one case but this requires further investigation to characterise its relevance BUT is highly unlikely to be a significant contributing factor in proteus syndrome.

CONCLUSION

The cause of proteus syndrome currently remains elusive. There are several groups out there working on discovering the cause so hopefully soon it will be understood.

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