**Abstract**

Fibrodysplasia Ossificans Progressiva (FOP) means "soft connective tissue that progressively turns to bone." FOP is a rare genetic disorder of progressive heterotopic ossification caused by a heterozygous activating mutation of the gene, in which muscle tissue such as tendons and ligaments are gradually replaced by bone (ossified) forming bone outside the skeleton. The first case of FOP may have been described by Guy Patin in 1692, but the first clear description was in 1740 by John Freke. People who have FOP experience different rates of new bone formation. A child with FOP will typically develop bones starting at the neck, then on the shoulders, arms, chest area and finally on the feet. Inability to fully open the mouth may cause difficulty in speaking and eating. They may also have breathing difficulties as a result of extra bone formation around the rib cage. The extra-skeletal bone formation causes progressive loss of mobility as the joints become affected. Inability to fully open the mouth may cause difficulty in speaking and eating. They may also have breathing difficulties as a result of extra bone formation around the rib cage. A child born with FOP has deformed great toes, possibly missing a joint or simply presenting with a notable lump at the minor joint. The formation of FOP bones usually occurs before the age of 10. A child with FOP will typically develop bones starting at the neck, then on the shoulders, arms, chest area and finally on the feet. The extra-skeletal bone formation causes progressive loss of mobility as the joints become affected. Inability to fully open the mouth may cause difficulty in speaking and eating. They may also have breathing difficulties as a result of extra bone formation around the rib cage. A child born with FOP has deformed great toes, possibly missing a joint or simply presenting with a notable lump at the minor joint. The formation of FOP bones usually occurs before the age of 10.  

**Introduction**

Fibrodysplasia Ossificans Progressiva (FOP) is a rare genetic disorder of progressive heterotopic ossification caused by a heterozygous activating mutation of the gene, in which muscle tissue such as tendons and ligaments are gradually replaced by bone (ossified) forming bone outside the skeleton. The extra-skeletal bone formation causes progressive loss of mobility as the joints become affected. Inability to fully open the mouth may cause difficulty in speaking and eating. They may also have breathing difficulties as a result of extra bone formation around the rib cage. The extra-skeletal bone formation causes progressive loss of mobility as the joints become affected. Inability to fully open the mouth may cause difficulty in speaking and eating. They may also have breathing difficulties as a result of extra bone formation around the rib cage.

**Results**

**MEGA5 Maximum Phylogenetic tree**

(Fig. 4) Shows the maximum phylogenetic tree of ACVR1, which makes a comparison between species.

**MEGA5 Minimum Phylogenetic tree**

(Fig. 5) Shows the Minimum Phylogenetic tree of ACVR1, which makes a comparison between species.

**Conclusions**

- In the conclusion the percentage of conservation of ACVR1 protein in is 95% percent, which implies that the protein has not changed over time.  
- In the conclusion the percentage of conservation of BMP protein in is 95% percent, which implies that the protein has not changed over time.

**References**

- http://medicine.medicine.maricopa.edu/article/1007104  
- leukemia, and lung cancer. The results of this study are consistent with animal data suggesting that ACVR1 may play a role in the pathogenesis of cancer.  
- In both the maximum phylogenetic trees for ACVR1 Rattus norvegicus, Homo sapiens and Mus musculus are most similar species , but for the maximum the least similar is Salmo salar and in the minimum Capra hircus.  
- In both the maximum phylogenetic trees for BMP Aburopla melanocercus, Bta taurus, Oryctolagus cuniculus and Sturnus musculus are most similar species , while the least similar is Asteracromys alliatus.  

**Acknowledgments**

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- * UMET  
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- NSF  
- Wanda Rodriguez  

**Methodology**

- PubMed  
- Clustal W2  
- MEGA  
- Genedoc  

**Figures**

1. FOP bone formation.  
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