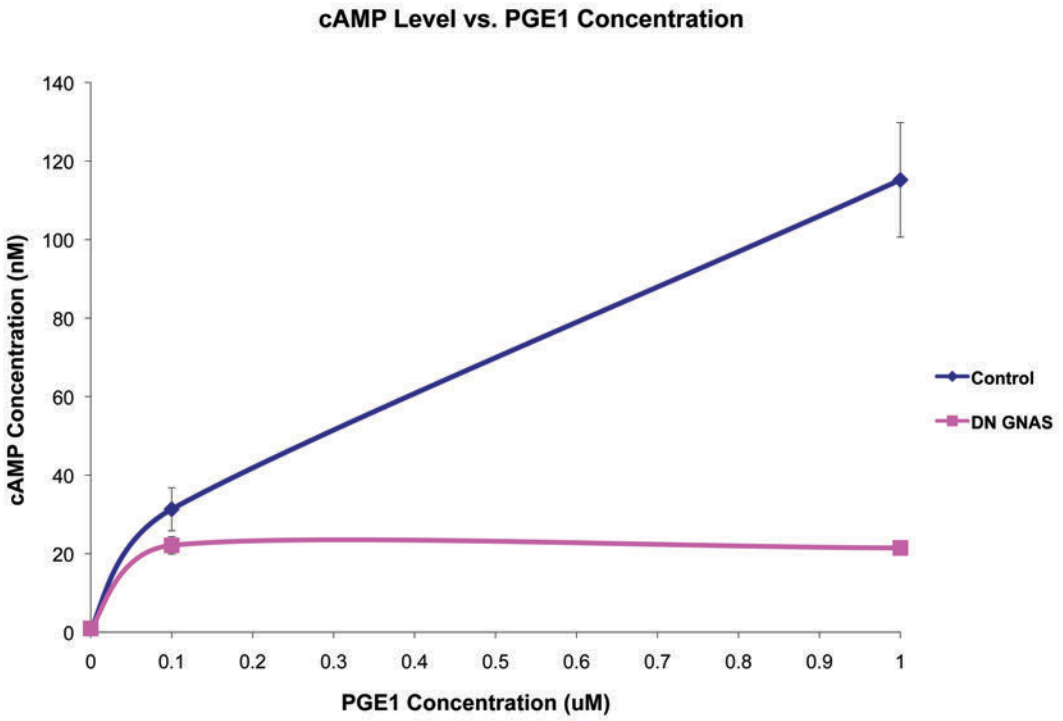
**Supplemental Table 1.**

**POH Patient Mutations in *GNAS***

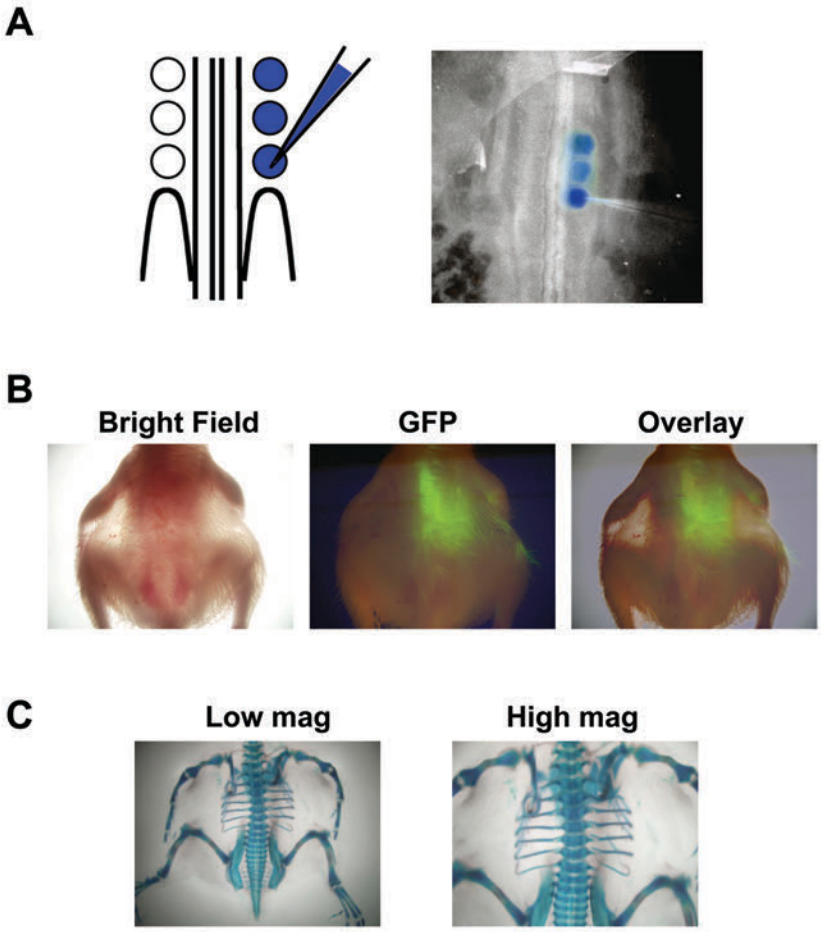
| Patient # | Mutation* |
|---|---|
| 1 | None detected |
| 2 | None detected |
| 3 | c.835-839dupl AACAG |
| 4 | c.860-861delTG |
| 5 | c.348insC |
| 6 | c.960insCT |
| 7 | c.561delCTGA** |
| 8 | c.348delC |
| 9 | c.565-568del GACT |
| 10 | IVS12 -1G>C |
| 11 | c.565-568del GACT |
| 12 | c.679-680insC |

*All detected *GNAS* mutations are nucleotide insertions, deletions, or splice site substitutions that cause a reading frameshift. Each mutation is identified by the cDNA nucleotide sequence of GNAS with +1 corresponding to the first nucleotide of the first codon (AUG). IVS12 denotes intron (intervening sequence) 12.

**Report of this mutation is through personal communication from Andreas Gal, MD, University Medical Center Hamburg-Eppendorf.




**Supplemental Figure 1.** GNAS-long-227L/D295N is a dominant-negative form of GNAS. A GNAS mutant form, GNAS-long-Q227L/D295N, and a GFP control in pcDNA3 vectors were transfected into 293 cells. PGE1 (0, 0.01, 0.1 and 1mM) strongly inhibited PGE1-mediated cAMP induction of GNAS-long-227L/D295N, suggesting GNAS-long-227L/D295N acts as a dominant-negative mutant of GNAS (DN-GNAS).




**Supplemental Figure 2.** Unilateral viral injection of somites leads to corresponding expression at the expected axial level. **A.** Illustration of retrovirus RCAS-GFP (control) or RCAS-DN-GNAS injection into the caudal somites on the right side of the chicken embryo. **B.** Images depicting the mosaic unilateral distribution of viral expression in RCAS-GFP-injected embryos 10 days after the injection; 1X magnification. **C.** Alcian blue staining of an RCAS-GFP-injected embryo at low magnification (0.71X) and high magnification (2X). Normal appearance of skeletal structures in GFP-injected side (the right side) indicates that the virus-injection per se does not perturb skeletal development.