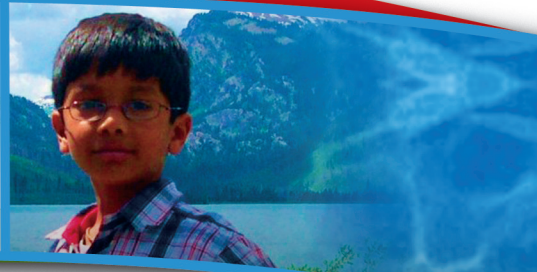
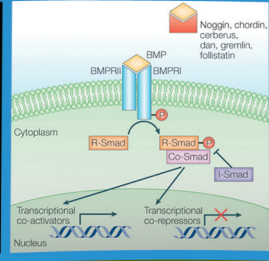
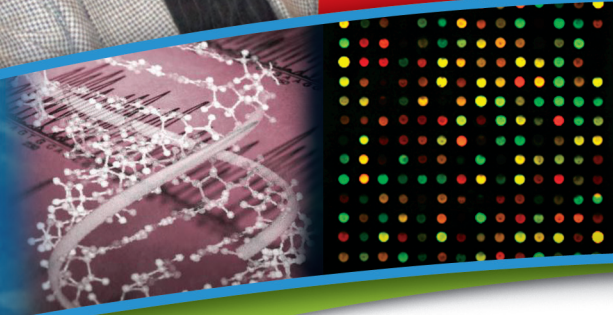




## Partha Mukhopadhyay, Ph.D.

**Assistant Professor**  
Department of Molecular,  
Cellular & Craniofacial Biology  
School of Dentistry



Dr. Mukhopadhyay's principal research focus involves investigation of the role and interaction of various peptide growth factors and transcriptional regulators, whose collective interplay can regulate neural tube and neural crest development, orofacial ontogenesis and palatogenesis. His specific research interests are to examine the role of the nuclear transcriptional regulators, coactivators and corepressors in craniofacial growth and anomalies, to analyze the role of growth factors like TGF $\beta$ s and BMPs in orofacial development as well as characterization of the various transcription factors and their role in normal orofacial growth. He has used DNA microarray technology to establish comprehensive "microRNA expression profiles" of developing murine orofacial tissue and of developing neural tube to identify important candidate microRNAs regulating palatogenesis and neural tube development, respectively.

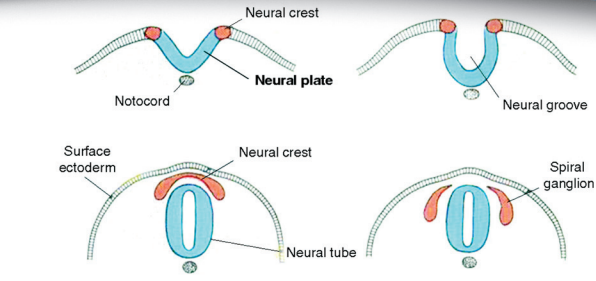
His current projects investigate: (1) BMP signaling (involving BMP receptor specific Smads such as Smad-1, Smad-5 and Smad-8/9) and the role of Id (inhibitor of differentiation) -1, Id-2, Id-3 and Id-4 helix-loop-helix transcription factors in orofacial ontogenesis (2) Epigenetics and Fetal Alcohol Syndrome (3) Developmental neurotoxicity of prenatal environmental tobacco smoke exposure.

Additional projects for which he has been awarded NIH funding investigate, employing a combined bioinformatic and molecular approach: (1) the interaction between differentially-expressed miRNAs and their target mRNAs, as well as to define the role of those miRNAs in regulating key processes required for normal orofacial development. (2) the epigenetically-regulated, differentially expressed candidate genes central to normal orofacial development and also, to identify and characterize the differentially-methylated genomic regulatory elements governing the expression of such candidate genes.

### Grants Funded:

**Role:** Co-PI  
**Co-PI:** Guy Brock  
**Co-I:** Ratnam Seelan; Ted Kalbfleisch  
**Title:** "Integrated Analysis: Epigenetic Regulation of Gene Expression During Orofacial Development"  
**Funding Agency:** NIH/NIDCR  
**Direct Costs Funded:** \$300,000

**Role:** Co-I / Subproject Director  
**PI:** Robert M Greene  
**Co-I / Subproject Director:** Guy Brock  
**Title:** "Molecular Determinants of Developmental Defects" - Center of Biomedical Research Excellence (COBRE)  
**Subproject Title:** "Integrated Analysis of RNA Expression During Orofacial Development".  
**Funding Agency:** NIH P20 NIH/GM103453  
**Subproject Direct Costs Funded:** \$180,000



### Publications:

**Mukhopadhyay P**, Rezzoug F, Kaikaus J, Greene RM, Pisano MM. Alcohol modulates expression of DNA methyltransferases and methyl CpG/CpG domain-binding proteins in murine embryonic fibroblasts. *Reprod Toxicol*. [Epub ahead of print] PubMed PMID: 23395981; Feb 6, (2013).

Seelan RS, Appana SN, **Mukhopadhyay P**, Warner DR, Brock GN, Pisano MM, Greene RM. Developmental profiles of the murine palatal methylome. *Birth Defects Res A Clin Mol Teratol* (in Press) (2013).

Seelan RS, **Mukhopadhyay P**, Warner DR, Webb CL, Pisano MM, Greene RM. The epigenetics of Sox4 regulation in murine palatogenesis. *Epigenomics* (in press) (2013).

Brock GN, **Mukhopadhyay P**, Pihur V, Webb C, Greene RM, Pisano MM. MmPalateMiRNA, an R package compendium illustrating analysis of miRNA microarray data. *Source Code Biol Med*. Jan 8;8(1):1, (2013).

Seelan RS, **Mukhopadhyay P**, Pisano MM, Greene RM. Developmental epigenetics of the murine secondary palate. *ILAR Journal*. 53 (3/4): 240-252 (2012).

**Mukhopadhyay P**, Singh S, Greene RM, Pisano MM. Strain-specific modifier genes governing craniofacial phenotypes. *Birth Defects Res A Clin Mol Teratol*. 94:162-175 (2012).

Warner DR, **Mukhopadhyay P**, Webb CL, Greene RM, Pisano MM. Identification of PRDM16 responsive genes in murine embryonic palate mesenchymal cells by coupling chromatin immunoprecipitation and genomic microarray analysis. *Exp Biol Med* 237:387-394 (2012).

**Mukhopadhyay P**, Brock G, Appana S, Webb C, Greene RM, Pisano MM. MicroRNA gene expression signatures in the developing neural tube. *Birth Defects Res A Clin Mol Teratol*. 91(8):744-762 (2011).

Warner DR, **Mukhopadhyay P**, Brock GN, Pihur V, Pisano MM, Greene RM. TGF $\beta$ 1 and Wnt-3a interact to induce unique gene expression profiles in murine embryonic palate mesenchymal cells. *Reprod Toxicol* 31:128-133 (2011).

### External Professional Activities:

Ad-hoc reviewer: *Developmental Dynamics*  
*Reproductive Toxicology*  
*Journal of Dental Research*  
*Computers in Biology and Medicine*