BIO SKETCH

NAME : Nandrot, Emeline, F.

POSITION TITLE : CR1 CNRS, Principal Investigator, PhD

EDUCATION / TRAINING

INSTITUTION AND LOCATION	DEGREE	Month/Year	FIELD OF STUDY
Hélène Boucher High School, Paris, France	Baccalaureate	1992	Mathematics
Denis Diderot-Paris VII University, France	BSc	1996	Human Genetics
Denis Diderot-Paris VII University, France	DEA/MSc	1997	Human Genetics
Denis Diderot-Paris VII University, France	PhD	2002	Molecular Biology-Ophthalmology
Weill Cornell Medical College, New York, USA	Post-doc.	2002-2007	Cell Biology-Ophthalmology
Denis Diderot-Paris VII University, France	HDR	2015	Cell Biology-Ophthalmology

POSITIONS AND EMPLOYMENTS

PERIOD	**Name of the Institution - Title of the Position**
07–08/1995	**Généthon, Evry, France – Internship** - Sequencing Service, Cell and Blood Bank
1996 – 1997	**Service de Recherche en Hémato-immunologie, CEA (Atomic and alternative Energies Center), St Louis Hospital, Paris, France - Undergraduate student** - Molecular study of human embryonic hematopoiesis: quantification of the expression pattern of known early genes
1997 – 2002	**Centre de Recherches Thérapeutiques en Ophtalmologie CERTO, Necker Medicine Faculty, Paris, France - Graduate Student** - Identification of the *Mertk* gene responsible for the RCS rat retinal degeneration. *In vitro* and *in vivo* non-viral restoration of the RCS RPE phagocytic function
2002 – 2007	**Dyson Vision Research Institute, Department of Ophthalmology, Weill Medical College of Cornell University, New York, USA - Post-Doctoral Associate** - Regulation of RPE phagocytosis by the αvβ5 integrin receptor–MFG-E8 ligand couple
2007 –	**Institut de la Vision, Department of Therapeutics, Paris, France - Principal Investigator, Team Leader** - Physiology of the retinal pigment epithelium and associated pathologies
2009 –	**Tenured Researcher Position, CNRS (National Center for Scientific Research-CR1 level)**, held at the Institut de la Vision, Paris, France

Scientific Interests:

I have been interested in understanding the molecular mechanisms underlying the daily phagocytic function of RPE cells and pathologies linked to its dysfunction since my PhD project. I sequentially identified the Mer tyrosine kinase receptor necessary for the internalization step of phagocytosis and characterized the couple alphavbeta5 integrin receptor–MFG-E8 ligand as responsible for the daily peak of POS phagocytosis by RPE cells. More recently, the work of my team has been focusing on the extracellular (ligands, proteases) and intracellular (protein domains, signaling molecules) pathways regulating MerTK function. More broadly, we are interested in the identification of new RPE phagocytic receptors, either for the elimination of aged rod or cone outer segments. In addition, one of our projects aims at identifying the molecular defects responsible for the RPE phenotype leading to the development of retinitis pigmentosa in patients affected by mutations in the the *PRPF* family of splicing factors (collaboration with Drs. Pierce (Boston, USA) and Bhattacharya (London, UK and Sevilla, Spain)). Other ongoing collaborations with various laboratories are related to the characterization of normal and mutated RPE cells derived from iPSCs (Drs. Goureau, Institut de la Vision, and Christelle Monville, I-STEM).

Other Experiences and Professional Memberships:

1999	Member, American Society of Human Genetics
2000-	Member, Association for Research and Vision and Ophthalmology (ARVO)
2012-	Member, American Society for Cell Biology
2008-	Ad-Hoc Reviewer for various journals: *Nature Protocols*, *PLoS ONE*, *International Journal of Molecular Sciences*, *Biochemistry and Biophysics Reports*, *Investigative Ophthalmology and Vision Science*, *Current Eye Research*, *Experimental Eye Research*, *Molecular Vision*, *Ophthalmic Research*, *Visual Neuroscience*
2011-	Ad-Hoc Reviewer for CNRS grants
2014-2017	ARVO Publications Committee

Selected Peer-reviewed Publications:

Law A-L, Parinot C, Chatagnon J, Gravez B, Sahel J-A, Bhattacharya SS and **Nandrot EF** (2015). Cleavage of MerTK from the RPE cell surface helps regulate the binding step of POS phagocytosis. *J Biol Chem*. 290(8):4941-4952.

Parinot C, Rieu Q, Chatagnon J, Finnemann SC and **Nandrot EF** (2014). Large-scale purification of photoreceptor outer segments for phagocytosis assays on retinal pigment epithelial cells. *J Vis Exp*. (94):e52100.

Farkas MH, Lew D, Bujakowska K, Sousa ME, Chatagnon C, Bhattacharya SS, Pierce EA and **Nandrot EF** (2014). Mutations in pre-mRNA processing factors 3, 8 and 31 cause dysfunction of the retinal pigment epithelium. *Am J Pathol*. 184(10):2641-2652.

Reichman S, Terray A, Slembrouck A, Nanteau C, Orieux G, Habeler W, **Nandrot EF**, Sahel J-A, Monville C and Goureau O (2014). From confluent human iPS cells to self-forming neural retina and retinal pigmented epithelium. *Proc Natl Acad Sci USA*. 111(23):8518-8523.

Sennlaub F, Auvynet C, Calippe B, Lavalette S, Poupel L, Hu SJ, Dominguez E, Camelo S, Levy O, Guyon E, Saederup N, Charo IF, Rooijen NV, **Nandrot E**, Bourges JL, Behar-Cohen F, Sahel JA, Guillonneau X, Raoul W, Combadiere C (2013). CCR2(+) monocytes infiltrate atrophic lesions in age-related macular disease and mediate photoreceptor degeneration in experimental subretinal inflammation in Cx3cr1 deficient mice. *EMBO Mol Med*. 5(11):1775-1793.

Doumanov JA, Zeitz C, Dominguez Gimenez P, Audo I, Krishna A, Alfano G, Bellido Diaz ML, Moskova-Doumanova V, Lancelot M-E, Sahel J-A, **Nandrot EF** and Bhattacharya SS (2013). Disease-causing mutations in BEST1 gene are associated with altered sorting of bestrophin-1 protein. *Int J Mol Sci*. 14:15121-15140.

Lustremant C, Habeler W, Plancheron A, Goureau O, Grenot L, de la Grange P, Audo I, **Nandrot EF** and Monville C (2013). Human induced pluripotent stem cells reveal early developmental molecular correlates with a probable Leber congenital amaurosis type I. *Cell Reprog.* 15(3):233-246.

Cronin T, Chung DC, Yang Y, **Nandrot EF** and Bennett J (2012). The signalling role of the alphavbeta5-integrin can impact efficacy of AAV in retinal gene therapy. *Pharmaceuticals* 5:447-459.

Nandrot EF, Silva KE, Scelfo C and Finnemann SC (2012). RPE cells use a MerTK-dependent mechanism to limit αvβ5 integrin binding activity. *Biol Cell*. 104(6):326-341 (cover image).

Yu C-C, **Nandrot EF**, Dun Y and Finnemann SC (2012). Dietary antioxidants prevent age-related retinal pigment epithelium actin damage and blindness in mice lacking αvβ5 integrin. *Free Rad Biol Med*. 52(3):660-670.

Aruta C, Giordano F, De Marzo A, Comitato A, Raposo G, **Nandrot EF** and Marigo V (2011). In vitro differentiation of retinal pigment epithelium from adult retinal stem cells. *Pig Cell Melan Res*. 24(1):233-240.

Graziotto JJ, Farkas MH, Bujakowska K, Deramaudt BM, Zhang Q, **Nandrot EF**, Inglehearn CF, Bhattacharya SS and Pierce EA (2011). Three Gene Targeted Mouse Models of RNA Splicing Factor RP Show Late Onset RPE and Retinal Degeneration. *Invest Ophthalmol Vis Sci.* 52(1):190-198.

Audo I, Sahel J-A, Mohand-Saïd S, Lancelot M-E, Antonio A, Moskova-Doumanova V, **Nandrot EF**, Doumanov J, Barragan I, Antinolo G, Bhattacharya SS and Zeitz C (2010). EYS is a major gene for rod-cone dystrophies in France. *Human Mutat.* 31(5):E1406-1435.

Audo I, Kohl S, Leroy BP, Munier FL, Guillonneau X, Mohand-Said S, Bujakowska K, **Nandrot EF**, Lorenz B, Preising M, Kellner U, Renner AB, Bernd A, Antonio A, Moskova-Doumanova V, Lancelot ME, Poloschek CM, Drumare I, Defoort-Dhellemmes S, Wissinger B, Léveillard T, Hamel CP, Schorderet DF, De Baere E, Berger W, Jacobson SG, Zrenner E, Sahel J-A, Bhattacharya SS and Zeitz C (2009). TRPM1 is mutated in patients with autosomal-recessive complete congenital stationary night blindness. *Am J Hum Genet.* 85(5):720-729.

Nandrot EF and Finnemann SC (2008). Lack of αvβ5 integrin receptor or its ligand MFG-E8: distinct effects on retinal function. *Ophthalmic Res.* 40(3-4):120-123.

Nandrot EF, Anand M, Almeida D, Atabai K, Sheppard D and Finnemann SC (2007). Essential role for MFG-E8 as ligand for alphavbeta5 integrin in diurnal retinal phagocytosis. *Proc Natl Acad Sci USA.* 104(29):12005-12010.

Nandrot EF, Anand M, Sircar M and Finnemann SC (2006). Novel role for alphavbeta5-integrin in retinal adhesion and its diurnal peak. *Am J Physiol Cell Physiol.* 290(4):C1256-1262.

Bemelmans AP, Bonnel S, Houhou L, Dufour N, **Nandrot E**, Helmlinger D, Sarkis C, Abitbol M and Mallet J (2005). Retinal cell type expression specificity of HIV-1-derived gene transfer vectors upon subretinal injection in the adult rat: influence of pseudotyping and promoter. *J Gene Med.* 7(10):1367-1374.

Nandrot EF, Kim YH, Brodie SE, Huang X, Sheppard D and Finnemann SC (2004). Loss of synchronized RPE phagocytosis and age-related blindness in mice lacking αvβ5 integrin. *J Exp Med.* 200:1539-1545 (cover image).

Dufour EM, **Nandrot E**, Marchant D, Van Den Berghe L, Gadin S, Issilame M, Dufier J-L, Marsac C, Carper D, Menasche M and Abitbol M (2003). Identification of novel genes and altered signaling pathways in the retinal pigment epithelium during the Royal College of Surgeons rat retinal degeneration. *Neurobiol Dis.* 14(2):166-180.

Nandrot E, Slingsby C, Basak A, Cherif-Chefchaouni M, Benazzouz B, Hajaji Y, Boutayeb S, Gribouval O., Arbogast L, Berraho A, Abitbol M and Hilal L (2003). Gamma-D crystallin gene (CRYGD) mutation causes autosomal dominant congenital cerulean cataracts. *J Med Genet.* 40(4):262-267.

Hilal L, **Nandrot E**, Belmekki M, Chefchaouni M, El Bacha S, Benazzouz B, Hajaji Y, Gribouval O, Dufier J, Abitbol M and Berraho A (2002). Evidence of clinical and genetic heterogeneity in autosomal dominant congenital cerulean cataracts. *Ophthalmic Genet.* 23(4):199-208.

Nandrot E, Dufour EM, Provost A, Péquignot MO, Bonnel S, Gogat K, Marchant M, Rouillac C, Sépulchre de Condé B, Bihoreau M-T, Shaver C, Dufier J-L, Marsac C, Lathrop M, Menasche M and Abitbol MM (2000). Homozygous deletion in the coding sequence of the c-mer gene in RCS rats unravels general mechanisms of physiological cell adhesion and apoptosis. *Neurobiol Dis.* 7(6 Pt B):586-599.

Teyssier-Le Discorde M, Prost S, **Nandrot E** and Kirszenbaum M (1999). Spatial and temporal mapping of c-kit and its ligand, stem cell factor expression during human embryonic haemopoiesis. *Br J Haematol.* 107(2):247-253.