CURRICULUM VITAE

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PERSONAL DATA

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Short CV

Research Interests

The activity of our laboratory is focused on the elucidation of the molecular mechanisms driving the transcritpional control played by hormones on target genes, mainly upon the identification of the specific epigenetic marks that label the process.

In particular, we have studied the modifications at the N-terminal tails of nucleosomal histones induced by chromatin recruitment of the estrogen receptor (ER), the nuclear receptor that mediates the estrogen action on responsive cells. On this regard, we have found that estrogen-induced transcription id governed by ER-triggered demethylation of lysine 9 in histone H3 realized by the lysine-specific demethylase 1 (LSD1), with consequent production of reactive oxygen species (ROS) and oxidation of nearby guanines (8-oxo-Gs) that result into formation of single and double-stranded breaks, allowing the establishment of contacts between sites distant on linear DNA. We have also evidenced that the histone-tail modification cited above represents a pre-requisite for addition of the phosphoryl mark to serine 10 that is known to accompany active gene expression.

In addition, we have pictured a new role to this latter epigenetic mark that in fact, by ensuring production of ROS to be cyclical, preserves DNA wholeness during active transcription. On this basis, we have highlighted a novel use of estrogens that, in combination with inhibition of serine 10 phosphorylation, could be used in new trials for treatment of human hormone-responsive cancers, as the hormone, under these conditions, induces selective apoptosis of target cells.

Publications

1. Perillo B, Tedesco I, Laezza C, Santillo M, Romano A, Aloj SM, Bifulco M: "Regulation of 3-Hydroxy-3-methylglutaryl Coenzyme A reductase gene expression in FRTL-5 cells". *J. Biol. Chem.* **270**, 15237-15241. **1995**

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3. Cicatiello L, Addeo R, Sasso A, Altucci L, Petrizzi VB, Borgo R, Cancemi M, Caporali S, Caristi S, Scafoglio C, Teti D, Brescian F, **Perillo B,** Weisz A: "Estrogens and progesterone promote persistent *CCND1* gene activation during G1 by inducing transcriptional derepression *via* c-Jun/c-Fos/Estrogen Receptor (Progesterone Receptor) complex assembly to a distal regulatory element and recruitment of Cyclin D1 to its own gene promoter". *Mol. Cell. Biol.* **24**, 7260-7274. **2004**

4. Perillo B, Ombra MN, Bertoni A, Cuozzo C, Sacchetti S, Sasso A, Chiariotti L, Malorni A, Abbondanza C, Avvedimento E: "DNA oxidation as triggered by H3K9me2 demethylation drives estrogen-induced gene expression". *Science* **319**, 202-206. **2008**

5. Angrisano T, Sacchetti S, Natale F, Cerrato A, Pero R, Keller S, Peluso S, **Perillo B**, Avvedimento VE, Fusco A, Bruni CB, Lembo F, Santoro M, Chiariotti L: "Chromatin and DNA methylation dynamics during retinoic acid-induced RET gene transcriptional activation in neuroblastoma cells". *Nucleic Acids Res.* **39**, 1993-2006. **2011**

6. Abbondanza C, De Rosa C, Ombra MN, Aceto F, Medici N, Altucci L, Moncharmont B, Puca GA, Porcellini A, Avvedimento EV, **Perillo B:** "Highlighting chromosome loops in DNA-picked chromatin (DPC)". *Epigenetics* **6**, 979-986. **2011**

7. Ombra MN, Di Santi A, Abbondanza C, Migliaccio A, Avvedimento VE, **Perillo B:** "Retinoic acid impairs estrogen signaling in breast cancer cells by interefering with activation of LSD1 via PKA". *Biochim. Biophys. Acta* **1829,** 480-486. **2013**

8. Perillo B, Di Santi A, Cernera G, Ombra MN, Castoria G, Migliaccio A: "Phosphorylation of H3 serine 10 by IKKα governs cyclical production of ROS in estrogen-induced transcription and ensures DNA wholeness". *Cell Death Differ.* **21,** 1503. **2014**

9. Perillo B, Di Santi A, Cernera G, Ombra MN, Castoria G, Migliaccio A: "Nuclear receptor-induced transcription is driven by spatially and timely restricted waves of ROS: the role of Akt, IKKα, and DNA damage repair enzymes". *Nucleus* **5,** 482-491. **2014**

10. Zuchegna C, Aceto F, Bertoni A, Romano A, **Perillo B,** Laccetti P, Gottesman ME, Avvedimento EV, Porcellini A: "Mechanism of retinoic acid-induced transcription: histone code, DNA oxidation and formation of chromatin loops". *Nucleis Acids Res*. **42,** 11040-11055. **2014**

Book chapters

1. Di Santi A, Cernera G, Migliaccio A, **Perillo B:** "Analysis of posttranslational modifications in the control of chromatin plasticity observed at estrogen-responsive sites in human breast cancer cells". *Methods Mol. Biol*. **1204,** 59-69. **2014**

Research group

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Maria Neve Ombra	Senior Scientist
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Gabriella Castoria	Full Professor
Annalisa Di Santi	Fellow
Gustavo Cernera	Fellow