Dr Mohamed ATTA

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RESEARCH INTERESTS

Chemistry of metalloenzymes.

- Protein chemistry and enzymology.
- Enzyme mechanisms.
- tRNA modifications (hydroxylation, thiolation, methylation…).
- EPR spectroscopy.
- Iron-sulfur/Iron-oxo clusters.

SUMMARY

Mohamed ATTA is research at CEA in Grenoble. I received a B.A. degree in chemistry from university of Fez (Morocco) in 1989 and a Ph.D. in biochemistry from the Joseph Fourier university in 1993, Grenoble France, where I was supervised by Prof. Marc Fontecave. I received a Swedish postdoctoral fellowship to study at biophysics department at Stockholm university, Sweden, under the supervision of Prof. Astrid Gräslund, and then a CNRS postdoctoral fellowship (poste rouge) to study at the biological organic chemistry laboratory at the university of Paris VI under the supervision of Prof. Andree Marquet. In 1996, I was promoted as permanent researcher at the CEA in Grenoble in the team of Dr. Jacques Meyer. In 2001, I joined the group of Prof. Marc Fontecave where my research focuses on the enzymology of natural product biosynthesis, with a particular interest in the use of S-adenosylmethionine and iron-sulfur clusters in enzyme catalysis. Currently, I started a collaboration as an invited researcher with Prof. Marc Fontecave at the Collège de France in Paris (2021-2023). I have expertise on the field of metallobiochemistry, catalysis and spectroscopy (light absorption, EPR and Mössbauer). During last 10 years, I acquired a strong knowledge in the tRNA-modyfing enzymes with a specific interest in metalloenzymes.

PUBLICATIONS

***h*-index : 31, papers: 66 including 3 book chapters and 6 reviews.**

Selected publications:

1. tRNA-modifying MiaE protein from *S. typhimurium* is a nonheme diiron monooxygenase. Mathevon

C., Pierrel F., Oddou JL., Garcia-Serres R., Blondin G., Latour JM., Ménage S., Gambarelli S., Fontecave M., **Atta M.** 2007, *Proc. Natl. Acad. Sci. U S A.* 104, 13295-13300.

2. Two Fe-S clusters catalyze sulfur insertion by radical-SAM methylthiotransferases. Forouhar F., Arragain S., **Atta M.**, Gambarelli S., Mouesca JM., Hussain M., Xiao R., Kieffer-Jaquinod S., Seetharaman J., Acton TB., Montelione GT., Mulliez E., Hunt JF., Fontecave M. 2013, *Nat. Chem. Biol.* 9, 333-338.
3. Biomimetic assembly and activation of [FeFe]-hydrogenases. Berggren G., Adamska A., Lambertz C., Simmons TR., Esselborn J., **Atta M**., Gambarelli S., Mouesca JM., Reijerse E., Lubitz W., Happe T., Artero V., Fontecave M. 2013, *Nature*. 499, 66-69.
4. Structural and functional characterization of the hydrogenase-maturation HydF protein. Caserta G., Pecqueur L., Adamska-Venkatesh A., Papini C., Roy S., Artero V., **Atta M**., Reijerse E., Lubitz W., Fontecave M. 2017, *Nat. Chem. Biol.* 13, 779-784.
5. Nonredox thiolation in tRNA occurring via sulfur activation by a [4Fe-4S] cluster. Arragain S., Bimai O., Legrand P., Caillat S., Ravanat JL., Touati N., Binet L., **Atta M**., Fontecave M., Golinelli-Pimpaneau B. 2017, *Proc. Natl. Acad. Sci. U. S. A.* 114, 7355-7360.
6. Pancreatic β-cell tRNA hypomethylation and fragmentation link TRMT10A deficiency with diabetes. Cosentino C, Toivonen S, Diaz Villamil E, **Atta M**, Ravanat JL, Demine S, Schiavo AA, Pachera N, Deglasse JP, Jonas JC, Balboa D, Otonkoski T, Pearson ER, Marchetti P, Eizirik DL, Cnop M, Igoillo-Esteve M. 2018, *Nucleic Acids Res*. 46, 10302-10318.
7. A Vastly Increased Chemical Variety of RNA Modifications Containing a Thioacetal Structure. Dal Magro C, Keller P, Kotter A, Werner S, Duarte V, Marchand V, Ignarski M, Freiwald A, Müller RU, Dieterich C, Motorin Y, Butter F, **Atta M**, Helm M. 2018, *Angew. Chem. In.t Ed. Engl.* 57, 7893-7897.
8. Engineering an [FeFe]-Hydrogenase: Do Accessory Clusters Influence O2 Resistance and Catalytic Bias? Caserta G, Papini C, Adamska-Venkatesh A, Pecqueur L, Sommer C, Reijerse E, Lubitz W, Gauquelin C, Meynial-Salles I, Pramanik D, Artero V, **Atta M**, Del Barrio M, Faivre B, Fourmond V, Léger C, Fontecave M. 2018, *J. Am. Chem. Soc.* 140, 5516-5526.
9. Ruminococcin C, a promising antibiotic produced by a human gut symbiont. Chiumento S, Roblin C, Kieffer-Jaquinod S, Tachon S, Leprètre C, Basset C, Aditiyarini D, Olleik H, Nicoletti C, Bornet O, Iranzo O, Maresca M, Hardré R, Fons M, Giardina T, Devillard E, Guerlesquin F, Couté Y, **Atta M**, Perrier J, Lafond M, Duarte V. 2019, *Sci. Adv.* 5, eaaw9969.
10. Solo act revealed to be duet. **Atta M**. 2019, *Nat. Chem. Biol.* 15, 1132-1133.
11. The unusual structure of Ruminococcin C1 antimicrobial peptide confers clinical properties. Roblin C, Chiumento S, Bornet O, Nouailler M, Müller CS, Jeannot K, Basset C, Kieffer-Jaquinod S, Couté Y, Torelli S, Le Pape L, Schünemann V, Olleik H, De La Villeon B, Sockeel P, Di Pasquale E, Nicoletti C, Vidal N, Poljak L, Iranzo O, Giardina T, Fons M, Devillard E, Polard P, Maresca M, Perrier J, **Atta M**, Guerlesquin F, Lafond M, Duarte V. 2020, *Proc Natl Acad Sci U S A.* 117, 19168-19177.
12. Structural, biochemical and functional analyses of tRNA-monooxygenase enzyme MiaE from Pseudomonas putida provide insights into tRNA/MiaE interaction. Carpentier P, Leprêtre C, Basset C, Douki T, Torelli S, Duarte V, Hamdane D, Fontecave M, **Atta M.** 2020, *Nucleic Acids Res*., 48, 9918-9930.