

METAbolism

Research group **META** - METAbolism

Group leader : [Anne-Marie Delort](https://iccf.uca.fr/annuaire/anne-marie-delort)(<https://iccf.uca.fr/annuaire/anne-marie-delort>), researcher

The three main research topics are:

- **Biodegradation of organic contaminants in soils:** the aims are to specify the key parameters governing the retention of various pesticides in soils and to study the influence of these interactions on their biodegradation, in terms of kinetics and metabolic pathways, in laboratory experiments and also in the field (Limagne plain).
- [Microbial metabolism in clouds](https://iccf.uca.fr/english-version/research/biocatalysis-and-metabolism/metabolism/microbial-metabolism-in-clouds)(<https://iccf.uca.fr/english-version/research/biocatalysis-and-metabolism/metabolism/microbial-metabolism-in-clouds>)
- **Biodegradation of plastics in surface waters and oceans**

People

[M. Pierre AMATO](https://iccf.uca.fr/annuaire/m-pierre-amato) (<https://iccf.uca.fr/annuaire/m-pierre-amato>)

[Pascale BESSE HOGGAN](https://iccf.uca.fr/annuaire/pascale-besse-hoggan) (<https://iccf.uca.fr/annuaire/pascale-besse-hoggan>)

[Isabelle CANET](https://iccf.uca.fr/annuaire/isabelle-canet) (<https://iccf.uca.fr/annuaire/isabelle-canet>)

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[Barbara ERVENS](https://iccf.uca.fr/annuaire/barbara-ervens) (<https://iccf.uca.fr/annuaire/barbara-ervens>)

[M. Cyril JOUSSE](https://iccf.uca.fr/annuaire/m-cyril-jousse) (<https://iccf.uca.fr/annuaire/m-cyril-jousse>)

[M. Mounir TRAIKIA](https://iccf.uca.fr/annuaire/m-mounir-traikia) (<https://iccf.uca.fr/annuaire/m-mounir-traikia>)

[Virginie VINATIER](https://iccf.uca.fr/annuaire/virginie-vinatier) (<https://iccf.uca.fr/annuaire/virginie-vinatier>)

PhD Students/Post-Doct

Name	Level	Financial Support	Dates
Mohamed Youness	PhD student	MESR	oct. 2009 - sept. 2013

Muriel Joly*	PhD student	MESR	oct. 2010 - dec. 2013
Edith Dumas**	PhD student	Région Auvergne	oct. 2010 - jul. 2014
Louis Carles#	PhD student	MESR	oct. 2013 - dec. 2016
Nolwenn Wirgot	PhD student	MESR	oct. 2013 - april 2017
Audrey Lallement§	PhD student	ANR	oct. 2014 - dec. 2017
Clément Descarpentries#	PhD student	MESR	oct. 2017 - ...
Saly Jaber	PhD student	Bourse Liban	oct. 2017 - ...
Miriam Tolpina	PhD student	Co-tutelle Russie	oct. 2017 - ...
Maxence Brissy	PhD student	ANR	oct. 2018 - ...
Mickaël Vaitilingom	Post-doct	UBP	sept. 2011 - march 2012
Matilte Halma	Post-doct	Région Auvergne	oct. 2012 - march 2014
Pascal Renard	Post-doct	ANR	april 2014 - september 2016
Muriel Joly	Post-doct	ANR	september 2016 - may 2017
Ludovic Besaury	Post-doct	ANR	september 2016 - august 2017
Boris Eyheraguibel	Post-doct	ANR and industrial contract	may 2013 - ...
Minghui Zhang	Post-doct	CNRS/MOPGA	oct. 2019 - september 2020
Amina Khaled	Post-doct	CNRS/MOPGA	oct. 2019 - september 2021

* 50% Laboratory LaMP - UMR6016

** 50% Team MI

50% Laboratory LMGE - UMR6023

§ 50 % Team Photochimie

Expertise

- Interface chemistry / biology / physics
- Microbiology
- Microbial metabolism
- Analytical chemistry (LC-MS, in situ and in vivo NMR)
- Metabolomics

Programs and grants

- ANR INHALE (2016-2020) Exploration de l'atmosphère comme écosystème
- ANR Oxomar (2016-2020) Abiotic and biotic degradation of oxo-biodegradable plastics in marine waters
- LEFE-CHAT CNRS (2015) Biophysicochimie des nuages tropicaux prélevés sur l'île de la Réunion
- Institut National du Cancer (INCa) (2014-2017) The endoplasmic reticulum stress response
- ANR Franco-allemande CHLOROFILTER (2014-2017) Impact of microorganisms as sinks of atmospheric chloromethane
- Programme CNRS EC2CO MicrobiEN (2014-2015) Evaluation des risques liés aux virus entériques de l'homme émis dans l'atmosphère à proximité des sites de traitement d'eaux usées ou de réutilisation en irrigation
- MetaboHUB (2013-2020) National Infrastructure for Metabolomics and Fluxomics
- ANR Blanc BEELOSS (2013-2017) Analyse de la synergie parasite/insecticide dans la perte des colonies d'abeilles à l'aide d'approches complémentaires chez *Apis mellifera* et l'organisme modèle *Drosophila melanogaster*
- ANR Blanc, BiOCAP (2013-2017) Impacts BIOlogiques et photochimiques sur la CAPacité oxydante du nuage
- ANR CESA Tricetox (2013-2017) Impact environnemental des herbicides -tricétones synthétiques et naturels : détection, adaptation microbienne, biodégradation et toxicité

- ANR Blanc Franco-américain SONATA (2013-2016) Surfactants fOrts daNs les aérosols ATmospheriques et leur rôle dans la formAtion des nuages
- Feder Oxobio (2013-2015) Etude de l'impact de facteurs environnementaux sur la biodégradation de matériaux d'emballage oxobiodégradables à base de polyéthylène
- Programme CNRS EC2CO MicrobiEN (2013-2014) Etude du FONctionnement des COmmunautés MICrobiennes des nuages par approche métatranscriptomique
- Projet FEDER Oxobio (2013-2014) Etude de l'impact de facteurs environnementaux sur la biodégradation de matériaux oxobiodégradables à base de polyéthylène
- Programme PHC Stefanik (Egide France –Slovaquie) N°26329PF (2012-2013) NMR Study of the structures of biosurfactants produced by bacteria isolated from cloud water and Arctic snow (BIOCLARC)
- Programme CNRS EC2CO MicrobiEN (2012-2013) Interactions complexes de Fer-Microorganismes dans les nuages. Impact sur la transformation de la matière organique
- Mise en place d'un test de biodégradabilité de polyoléfines additivées pré-oxydées en collaboration avec le CNEP ACCORD AFNOR AC T51-808, « Plastiques — Evaluation expérimentale de l'oxobiodégradabilité de matériaux polyoléfiniques sous forme de films —Méthodologie et exigences »
- Programme CNRS EC2CO EcoDYN (2012-2013) Devenir et impact d'un cocktail d'herbicides sur des groupes fonctionnels microbiens : élaboration de bioindicateurs de perturbation
- Programme Franco-Allemand CNRS-DFG BIOCLOUDS (2009-2013) Etude des propriétés glaçogènes des bioaérosols et de leur impact sur les nuages.
- ANR Franco-Allemand Metalipox (2009-2011) Influence des corps gras chauffés sur les processus cellulaires et métaboliques modulés par le PPAR chez le porc

Academic and industrial collaborations

NATIONAL ACADEMIC COLLABORATIONS

Partners	Collaborator(s)	Topic
MI (group HDL ICCF)	C. Mousty, V. Prévot, C. Forano	Sorption – Interactions soil-contaminant-micro-organisms Biosensors
LaMP, UMR 6016 (UBP,	L. Deguillaume, M. Monier, A. Flossmann, N. Chaumerliac	Microbial monitoring of clouds at the puy de Dôme summit. Impact of microbial metabolic activity on cloud composition. Ice-nucleating properties of micro-organisms from clouds and impact on atmospheric microphysical processes

Clermont-Ferrand)		
LMGE, UMR 6023 (UBP, Clermont-Ferrand)	I. Batisson, C. Mallet, J. Bohatier, D. Debroas, I. Mary, F. Henault	Biotransformation of pesticides in soil and impact on the edaphic microbial communities. Activity and phylogeny of cloud micro-organisms
VetAgro Sup (Clermont-Ferrand)	C. Perrier, N. Guix	Characterisation of soils – Study of the fate of pesticides on an experimental field
INRA Avignon	C. Morris	Ice-nucleating properties of micro-organisms from clouds and impact on atmospheric microphysical processes
Brest University - IRD	G. Sarthou	Iron speciation

INTERNATIONAL ACADEMIC COLLABORATIONS

Partners	Collaborator(s)	Topic
Slovak Academy of Sciences (Bratislava)	M. Matulova, P. Capek	Atmospheric chemistry
London University (UK)	B. Moffett, S. Henderson	Micro-organisms from snow in Arctic region
Karlsruhe Institute of Technology (Germany)	O. Möhler	Properties Ice-nucleating properties of micro-organisms from clouds and impact on atmospheric microphysical processes
Mainz University (Germany)	U. Poschl	Ice-nucleating properties of micro-organisms from clouds and impact on atmospheric microphysical processes
Zlin University	M. Koutny	Biodegradability of polymers

(Czech Republic)		
Pushchino Sciences Academy (Russia)	T. Alekseeva	Characterisation and fractioning of soils (clays and organic matter) - Interactions pesticides/ soil matrices

INDUSTRIAL PARTNERS

Partners	Collaborator (s)	Topic
CNEP (Aubière)	J. Lemaire, S. Bonhomme	Biodegradability of polymers
Associations NEOSAC and E3S (Sainte Sigolène, France)	G. Samuel, G. Pichon	Biodegradability of polymers
Total Petrochemical Research, Freuly (Belgium)	J.M. Brusson	Biodegradability of polymers
Basell Poliolefin Italia, Ferrata (Italy)	S. Pitteri	Biodegradability of polymers
Greentech (Saint Beauzire, France)	J.Y. Berthon, D. Tropel	Promotion of a microbial collection from clouds; search for compounds and biological activities of industrial interest

Publications

2018

C. JOUSSE, C. DALLE, I. CANET, M. LAGRÉE, M. TRAIKIA, B. LYAN, C. MENDES, M. SANCELME, P. AMATO, A.-M. DELORT* Metabolomic study of the response to cold shock in a strain of *Pseudomonas syringae* isolated from cloud water. *Metabolomics*, 2018, 14, 11.

N. JAEGER*, L. BESAURY, E. KROBER, A.-M. DELORT, M. GREULE, K. LENHART, T. NADALIG, S. VUILLEUMIER, P. AMATO, S. KOLB, F. BRINGEL, F. KEPPLER* Chlormethane degradation in soils : A combined microbial and two-dimensional stable isotope approach. *Journal of Environmental Quality*, 2018, 47, 254-262.

N. JAEGER*, L. BESAURY, A. N. RÖHLING, F. KOCH, A.-M. DELORT, C. GASC, M. GREULE, T. NADALIG, P. PEYRET, S. VUILLEUMIER, S. KOLB, P. AMATO, F. BRINGEL, F. KEPPLER* Evidence for chloromethane formation and degradation by plants. *Science of the Total Environment*, 2018, 634, 1278-1287.

A.T. LEBEDEV*, O. V. POLYAKOVA, D. M. MAZUR, V. B. ARTAEV, I. CANET, A. LALLEMENT, M. VAITILINGOM, L. DEGUILLAUME, A.-M. DELORT* Detection of semi-volatile compounds in cloud waters by GCxGC-TOF-MS. Evidence of phenols and phthalates as priority pollutants. *Environmental Pollution*, 2018, 241, 616-625.

B. EYHERAGUIBEL*, M. LEREMBOURE, M. TRAIKIA, M. SANCELME, S. BONHOMME, D. FROMAGEOT, J. LEMAIRE, J. LACOSTE, A.-M. DELORT Environmental scenarii for the degradation of oxo-polymers. *Chemosphere*, 2018, 198, 182-190.

A. LALLEMENT, V. VINATIER, M. BRIGANTE, L. DEGUILLAUME, A.-M. DELORT*, G. MAILHOT* First evaluation of the effect of microorganisms on steady state hydroxyl radical concentrations in atmospheric waters. *Chemosphere*, 2018, 212, 715-722.

C. DUSSUD*, C. HUDEC, M. GEORGE, P. FABRE, P. HIGGS, S. BRUZAUD, A.-M. DELORT, B. EYHERAGUIBEL, A.-L. MEISTERTZHEIM, J. JACQUIN, J. CHENG, N. CALLAC, C. ODOBEL, S. RABOUILLE, J.-F. GHIGLIONE* Colonization of non-biodegradable and biodegradable plastics by marine microorganisms. *Frontiers in Microbiology*, 2018, 9, Article 1571.

J. P. HARRISON*, C. BOARDMAN, K. O'CALLAGHAN, A.-M. DELORT, J. SONG Biodegradability standards for carrier bags and plastic films in aquatic environments : a critical review. *Royal Society Open Science*, 2018, 5, 171792.

M. YOUNESS, M. SANCELME, B. COMBOURIEU, P. BESSE-HOGGAN* Identification of new metabolic pathways in the enantioselective fungicide tebuconazole biodegradation by *Bacillus* sp. 3B6. *Journal of Hazardous Materials*, 2018, 351, 160-168.

L. CARLES*, M. JOLY, F. BONNEMOY, M. LEREMBOURE, F. DONNADIEU, I. BATISSON, P. BESSE-HOGGAN Biodegradation and toxicity of a maize herbicide mixture : mesotrione, nicosulfuron and S-metolachlor. *Journal of Hazardous Materials*, 2018, 354, 42-53.

S ROMDHANE, M. DEVERS-LAMRANI, F. MARTIN-LAURENT, A. BEN JRAD, D. RAVIGLIONE, M. V. SALVIA, P. BESSE-HOGGAN, F. E. DAYAN, C. BERTRAND, L. BARTHELMEBS* Evidence for photolytic and microbial degradation processes in the dissipation of leptospermone, a natural -triketone herbicide. *Environ. Sci. Pollut. Res.*, 2018, 25, 29848–29859.

J. JOST*, V. RATSIMBAZAFY, T. TRANG NGUYEN, T. LINH NGUYEN, H. DUFAT, A. DUGAY, A. BA, G. SIVADIER, Y. MAFILAZA, C. JOUSSE, M. TRAÏKIA, M. LEREMBOURE, E. AUDITEAU, A. RAHARIVELO, E. NGOUNGOU, S. M. KARIUKI, C. R. NEWTON, P.M. PREUX Quality of antiepileptic drugs in sub Saharan Africa : A study in Gabon, Kenya, and Madagascar. *Epilepsia*, 2018, 59, 1351-1361.

A. LALLEMENT, L. BESAURY, E. TIXIER, M. SANCELME, P. AMATO, V. VINATIER, I. CANET, O. V. POLYAKOVA, V. B. ARTAEV, A. T. LEBEDEV, L. DEGUILLAUME, G. MAILHOT, A.-M. DELORT* Potential for phenol biodegradation in cloud waters. *Biogeoscience*, 2018, 15, 5733-5744.

C. SARO*, U.M. HOHENESTER, M. BERNARD, M. LAGREE, C. MARTIN, M. DOREAU, H. BOUDRA, M. POPOVA, D.P. MORGAVI* Effectiveness of interventions to modulate the rumen microbiota composition and function in pre-ruminant and ruminant lambs. *Frontiers in Microbiology*, 2018, sous presse (doi:10.3389/fmicb.2018.01273).

2017

L. CARLES, M. JOLY, F. BONNEMOY, M. LEREMBOURE, I. BATISSON*, P. BESSE-HOGGAN* Identification of sulfonyleurea biodegradation pathways enabled by a novel nicosulfuron-transforming strain *Pseudomonas fluorescens* SG-1 : toxicity assessment and effect of formulation. *Journal of Hazardous Materials*, 2017, 324, 184-193.

A. DUCONSEILLE, M. TRAIKIA, M. LAGREE, C. JOUSSE, G. PAGES, P. GATELLIER, T. ASTRUC, V. SANTE-LHOUTELLIER* The impact of processing and aging on the oxidative potential, molecular structure and dissolution of gelatin. *Food Hydrocolloids*, 2017, 66, 246-258.

D. COURAULT*, I. ALBERT, S. PERELLE, A. FRAISSE, P. RENAULT, A. SALEMKOUR, P. AMATO Assessment and risk modeling of airborne enteric viruses emitted from wastewater reused for irrigation. *Science of the Total Environment*, 2017, 592, 512-526.

L. CARLES*, F. ROSSI, M. JOLY, P. BESSE-HOGGAN, I. BATISSON, J. ARTIGAS Biotransformation of herbicides by aquatic microbial communities associated to submerged leaves. *Environ. Sci. Pollut. Res.*, 2017, 24, 3664-3674.

E. DUMAS, M. GIRAUDO, E. GOUJON, M. HALMA, E. KNHILI, M. STAUFFERT, I. BATISSON, P. BESSE-HOGGAN*, J. BOHATIER, P. BOUCHARD, H. CELLE-JEANTON, M. COSTA GOMES, F. DELBAC, C. FORANO, P. GOUPIL, N. GUIX, P. HUSSON, G. LEDOIGT, C. MALLET, C. MOUSTY, V. PREVOT, C. RICHARD, S. SARRAUTE Fate and ecotoxicological impact of new generation herbicides from the triketone family : An overview to assess the environmental risks. *Journal of Hazardous Materials*, 2017, 325, 136-156.

L. F. LEPRE, J. SZALA-BILNIK, L. PISON, M. TRAIKIA, A. A. H. PADUA, R. A. ANDO, M. F. COSTA GOMES* Can the tricyanomethanide anion improve CO₂ absorption by acetate-based ionic liquids ? *Physical Chemistry Chemical Physics*, 2017, 19, 12431-12440.

J.-M. ANDANSON*, N. PAPAICONOMOU, P. CABLE, M. TRAIKIA, I. BILLARD, P. HUSSON The role of association of ions in ionic liquid/molecular solvent mixtures on metal extraction. *Physical Chemistry Chemical Physics*, 2017, 19, 28834-28840.

C. GIBARD, K. FAUCHE, R. GUILLOT, L. JOUFFRET, M. TRAIKIA, A. GAUTIER, F. CISNETTI* Access to silver-NHC complexes from soluble silver species in aqueous or ethanolic ammonia. *Journal of Organometallic Chemistry*, 2017, 840, 70-74.

B. EYHERAGUIBEL*, M. TRAIKIA, S. FONTANELLA, M. SANCELME, S. BONHOMME, D. FROMAGEOT, J. LEMAIRE, G. LAURANSON, J. LACOSTE, A.-M. DELORT* Characterization of oxidized oligomers from polyethylene films by mass spectrometry and NMR spectroscopy before and after biodegradation by a *Rhodococcus rhodochrous* strain. *Chemosphere*, 2017, 184, 366-374.

N. WIRGOT, V. VINATIER, L. DEGUILLAUME, M. SANCELME, A.-M. DELORT* H₂O₂ modulates the energetic metabolism of the cloud microbiome. *Atmos. Chem. Phys.*, 2017, 17, 14841-14851.

P. AMATO*, M. JOLY, L. BESAURY, A. OUDART, N. TAIB, A. MONÉ, L. DEGUILLAUME, A.-M. DELORT, D. DEBROAS Active microorganisms thrive among extremely diverse communities in cloud water. *PLoS ONE*, 2017, August 8, 1-22.

T. ŠANTL-TEMKIV*, P. AMATO, U. GOSEWINKEL, R. THYRHAUG, A. CHARTON, B. CHICOT, K. FINSTER, G. BRATBAK, J. LÖNDAHL A high-flow-rate impinger for the study of concentration, metabolic viability, and ice nucleation activity of airborne bacteria. *Environmental Science and Technology*, 2017, 51, 11224-11234.

P.B. SANCHEZ, M. TRAIKIA, A. DEQUIDT, J. GARCIA, A.A.H. PADUA* Molecular understanding of pyridinium ionic liquids as absorbents with water as refrigerant for use in heat pumps. *AIChE J.*, 2017, 63, 3523–3531.

G. POUZET, E. PEGHAIRE, M. AGUÈS, J.-L. BARAY, F. CONEN, P. AMATO* Atmospheric processing and variability of biological ice nucleating particles in precipitation at Opme, France. *Atmosphere*, 2017, 8, 229.

V. VINATIER, N. WIRGOT, M. JOLY, M. SANCELME, M. ABRANTES, L. DEGUILLAUME, A.-M. DELORT* Siderophores in Cloud Waters and Potential Impact on Atmospheric Chemistry : Production by Microorganisms Isolated at the Puy de Dôme Station. *Environ. Sci. Technol.*, 50, 9315-9323.

M. PASSANANTI, V. VINATIER, A.-M. DELORT, G. MAILHOT, M. BRIGANTE* Siderophores in Cloud Waters and Potential Impact on Atmospheric Chemistry : Photoreactivity of Iron Complexes under Sun-Simulated Conditions. *Environ. Sci. Technol.*, 2016, 50, 9324–9332.

P. RENARD, I. CANET, M. SANCELME, N. WIRGOT, L. DEGUILLAUME, A.-M. DELORT* Screening of cloud microorganisms isolated at the puy de Dôme (France) station for the production of biosurfactants. *Atmos. Chem. Phys.*, 2016, 16, 12347-12358 (highlight article).

J.-M. ANDANSON*, X. MENG, M. TRAÏKIA, P. HUSSON* Quantification of the Impact of Water as an Impurity on Standard Physico-Chemical Properties of Ionic Liquids. *Journal of Chemical Thermodynamics*, 2016, 94, 169–176.

L. F. LEPRE, J. SZALA-BILNIK, A. A. H. PADUA, M. TRAÏKIA, R. A. ANDOA, M. F. COSTA GOMES* Tailoring the properties of acetate-based ionic liquids using the tricyanomethanide anion. *Physical Chemistry Chemical Physics*, 2016, 18, 23285-23295.

M. LLOPIS, A.-M. CASSARD*, L. WRZOSEK, L. BOSCHAT, A. BRUNEAU, G. FERRERE, V. PUCHOIS, J.-C. MARTIN, P. LEPAGE, T. LE ROY, L. LEFÈVRE, B. LANGELIER, F. CAILLEUX, A.-M. GONZÁLEZ-CASTRO, S. RABOT, F. GAUDIN, H. AGOSTINI, S. PRÉVOT, D. BERREBI, D. CIOCAN, C. JOUSSE, S. NAVEAU, P. GÉRARD, G. PERLEMUTER* Intestinal microbiota contributes to individual susceptibility to alcoholic liver disease. *Gut*, 2016, 65, 830-839.

L. CARLES, P. BESSE-HOGGAN, M. JOLY, A. VIGOUROUX, S. MORERA, I. BATISSON* Functional and structural characterization of two *Bacillus megaterium* nitroreductases biotransforming the herbicide mesotrione. *Biochemical Journal*, 2016, 473, 1443-1453.

M. HALMA, A. KHENIFI, M. SANCELME, P. BESSE-HOGGAN, P.O. BUSSIERE, V. PREVOT, C. MOUSTY* Thin bacteria/Layered Double Hydroxide films using a layer-by-layer approach. *Journal of Colloid & Interface Science*, 2016, 474, 151-158.

F. DONNADIEU, P. BESSE-HOGGAN, C. FORESTIER, J. ARTIGAS* Influence of streambed substratum composition on stream microbial communities exposed to the fungicide tebuconazole. *Freshwater Biology*, 2016, 61, 2026-2036.

F. CAMPS BRES, C. GUERARD-HELAINÉ, V. HELAINÉ, C. FERNANDES, I. SANCHEZ-MORENO, M. TRAIKIA, E. GARCIA-JUNCEDA, M. LEMAIRE* L-Rhamnulose-1-phosphate and L-fuculose-1-phosphate aldolase mediated multi-enzyme cascade systems for nitrocyclitol synthesis. *Journal of Molecular Catalysis B : enzymatic*, 2015, 114, 50-57. R. WOLF, J.G SLOWIK, C. SCHAUPP, P. AMATO, H. SAATHOF, O. MÖHLER, A.S.H. PRÉVÔT, U. BALTENSPERGER* Characterization of ice-nucleating bacteria using on-line electron impact ionization aerosol mass spectrometry. *Journal of Mass Spectrometry*, 2015, 50, 662-671.

P. AMATO*, M. JOLY, C. SCHAUPP, E. ATTARD, O. MOEHLER, C. E ; MORRIS, Y. BRUNET, A.-M. DELORT Survival and ice nucleation activity of bacteria as aerosol in a cloud simulation chamber. *Atmospheric Chemistry and Physics*, 2015, 15, 6455-6465.

C. DELATTRE*, G. PIERRE, C. GARDARIN, M. TRAIKIA, R. ELBOUTACHFAITI, A. ISOGAI, P. MICHAUD Antioxidant activities of a polyglucuronic acid sodium salt obtained from TEMPO-mediated oxidation of xanthan. *Carbohydrate Polymers*, 2015, 116, 34-41.

H. SROUR, M. TRAIKIA, B. FENET, H. ROUAULT, M. F. COSTA GOMES, C. C. SANTINI, P. HUSSON* Effect of Nitrile-Functionalization of Imidazolium-Based Ionic Liquids on Their Transport Properties, Both Pure and Mixed with Lithium Salts. *Journal of Solution Chemistry*, 2015, 44, 495-510.

M. JOLY*, P. AMATO, M. SANCELME, V. VINATIER, M. ABRANTES, L. DEGUILLAUME, A.-M. DELORT Survival of microbial isolates from clouds toward simulated atmospheric stress factors. *Atmospheric Environment*, 2015, 117, 92-98.

M. SABART*, K. CRENN, F. PERRIERE, A ABILA, M. LEREMBOURE, J. COLOMBET, C. JOUSSE, D. LATOUR Co-occurrence of microcystin and anatoxin-a in the freshwater lake Aydat (France) : analytical and molecular approaches during a three-year survey. *Harmful algae*, 2015, 48, 12-20.

C. BARDOT, P. BESSE-HOGGAN, L. CARLES, M. LE GALL, G. CLARY, P. CHAFEY, C. FEDERICI, C. BROUSSARD, I. BATISSON* How the edaphic *Bacillus megaterium* strain Mes11 adapts its metabolism to the herbicide mesotrione pressure. *Environmental Pollution*, 2015, 199, 198-208.

P. JOLY*, F. BONNEMOY, P. BESSE-HOGGAN, F. PERRIERE, O. CROUZET, N. CHEVIRON, C. MALLET Responses of Limagne "Clay/Organic matter-rich" soil microbial communities to realistic formulated herbicide mixtures, including S-metolachlor, mesotrione and nicosulfuron. *Water Air Soil Pollut.*, 2015, 226, 413, 15 pages.

Y. DENG, I. BEADHAM, M. GHAVRE, M. COSTA GOMES, N. GATHERGOOD*, P. HUSSON, B. LEGERET, B. QUILTY, M. SANCELME, P. BESSE-HOGGAN* When can ionic liquids be considered

readily biodegradable ? Biodegradation pathways of pyridinium, pyrrolidinium and ammonium-based ionic liquids. Green Chemistry, 2015, 17, 1479-1491.

M. HALMA, C. MOUSTY, C. FORANO, M. SANCELME, P. BESSE-HOGGAN, V. PREVOT* Bacteria encapsulated in Layered Double Hydroxides : an efficient Bionanohybrid for remediation processes. Colloids and Surfaces B : Biointerfaces, 2015, 126, 344-350.

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