

Equipe de recherche n° E2

Algal Genetics

Annexe 4

Nom de l'équipe : Algal Genetics

Acronyme : GA

Nom du responsable d'équipe pour le contrat en cours : Mark Cock/Susana Coelho

Nom du responsable d'équipe pour le contrat à venir : Mark Cock/Susana Coelho

On dressera la liste des produits de la recherche et des activités de recherche en respectant les indications de nombre et de présentation données dans le dossier d'autoévaluation.

Si l'équipe n'est pas concernée par un type de produit, précisez que cette rubrique est « sans objet ».

Lorsque des produits sont communs à plusieurs équipes de l'unité, ils sont regroupés à part dans la rubrique concernée.

Dans le cas de publications cosignées par plusieurs personnes, la liste de tous les auteurs sera établie, excepté lorsque le nombre de co-auteurs sera supérieur à la quinzaine. Les noms des membres de l'équipe interne seront soulignés dans la liste des co-auteurs.

Pour les personnels recrutés au cours des cinq dernières années, les produits et les activités réalisés dans leur unité de recherche d'origine seront mentionnés dans une liste séparée.

I. PRODUITS DE LA RECHERCHE

1. Journaux / revues

Articles scientifiques (15 +5)

*Lipinska A, Toda N, Heesch S, Peters A, Cock JM, Coelho SM. (2017) Multiple gene movements into and out of haploid sex chromosomes. *Genome Biology* 18(1):104.

Cock JM, Liu F, Duan D, Bourdareau S, Lipinska A, Coelho SM, Tarver JE (2017). Rapid evolution of microRNA loci in the brown algae. *Genome Biology and Evolution* 9:740-749

*Macaisne N, Liu F, Scornet D, Peters AF, Lipinska A, Perrineau M, Henry A, Strittmatter M, Coelho SM, Cock JM. (2017) The *Ectocarpus IMMEDIATE UPRIGHT* gene encodes a member of a novel family of cysteine-rich proteins with an unusual distribution across the eukaryotes. *Development* doi: 10.1242/dev.141523

Highlighted in the "In this Issue" section of Vol. 144, Issue 3 of Development.

*Cormier A, Avia A, Sterck L, Derrien T, Wucher V, Andres G, Monsoor M, Godfroy O, Lipinska A, Perrineau MM, Van De Peer Y, Hitte C, Corre E, Coelho SM, Cock JM (2017) Re-annotation, improved large-scale assembly and establishment of a catalogue of non-coding loci for the genome of the model brown alga *Ectocarpus*. *New Phytologist* 14:219-232

*Avia K, Coelho SM, Montecinos G, Cormier A, Lerck F, Mauger S, Faugeron S, Valero M, Cock JM and Boudry P (2017) High-density genetic map and identification of QTLs for responses to high temperature and low salinity stresses in the model alga *Ectocarpus*. *Sci. Reports* 7:43241.

Guzinski J, Mauger S, Cock JM and Valero M (2016) Development and characterization of expressed sequence tag-derived microsatellites markers for *Saccharina latissima*. *Journal of Applied Phycology*, 28:3057-3070

Fischl R, Bertelsen K, Gaillard F, Coelho SM, Michel G, Klinger M, Boyen C, Czjzek M, Herve C (2016) The cell wall active mannuronan C5-epimerases in the model brown alga *Ectocarpus*: from gene context to recombinant protein. *Glycobiology* doi: 10.1093/glycob/cww040.

Lipinska A, Ahmed S, Peters AF, Faugeron S, Cock JM, Coelho SM (2015) Development of PCR-based markers to determine the sex of kelps. *PLoS One* 10(10):e0140535. doi: 10.1371/journal.pone.0140535.

*Luthringer R, Lipinska A, Roze D, Cormier A, Peters A, Cock JM, Coelho SM (2015) The pseudoautosomal regions of the U/V sex chromosomes of the brown alga *Ectocarpus* exhibit unusual features. *Mol Biol Evol* doi: 10.1093/molbev/msv173

Tarver J, Cormier A, Pinzon N, Taylor R, Carré W, Strittmatter M, Seitz H, Coelho SM, Cock JM (2015) MicroRNAs and the evolution of complex multicellularity: identification of a large, diverse complement of microRNAs in the brown alga *Ectocarpus*. *Nucleic Acid Research* 43:6384-98. doi: 10.1093/nar/gkv578

*Lipinska A, Cormier A, Luthringer R, Peters AF, Corre E, Gachon CMM, Cock JM, Coelho SM. (2015) Sexual dimorphism and the evolution of sex-biased gene expression in the brown alga *Ectocarpus*. *Mol Biol Evol.* (I.F. 13.649) doi: 10.1093/molbev/msv049

Couceiro L, Le Gac M, Hunsperger HM, Mauger S, Destombe C, Cock JM, Ahmed S, Coelho SM, Valero M, Peters, AF (2015) Evolution and maintenance of haploid-diploid life cycles in natural populations: the case of the marine brown alga *Ectocarpus*. *Evolution* 69:1808-22

Godfroy O, Peters AF, Coelho SM, Cock JM (2015) Genome-wide comparison of ultraviolet and ethyl methanesulphonate mutagenesis methods for the brown alga *Ectocarpus* **Marine Genomics** pii: S1874-7787(15)00047-1. doi: 10.1016/j.margen.2015.03.007

***Ahmed S, Cock J.M., Pessia E, Luthringer R., Cormier A, Robuchon M, Sterck L, Peters AF, Dittami SM, Corre E., Valero M., Aury J.-M., Roze D., Van de Peer Y., Bothwell J., Marais G., Coelho SM** (2014). A haploid system of sex determination in the brown alga *Ectocarpus* sp. **Current Biology** doi: 10.1016/j.cub.2014.07.042

Comment on Science Ouest n. 325 Nov. 2014 (first page)

Heitman J and Fang Y: F1000Prime Recommendation of [Ahmed S et al., Curr Biol 2014, 24(17):1945-57]. In F1000Prime, 20 Apr 2017; DOI: 10.3410/f.718552038.793530898. F1000Prime.com/718552038#eval793530898

Bloomfield G: F1000Prime Recommendation of [Ahmed S et al., Curr Biol 2014, 24(17):1945-57]. In F1000Prime, 03 Feb 2015; DOI: 10.3410/f.718552038.793503523. F1000Prime.com/718552038#eval793503523

Fu, G., Nagasato, C., Oka, S., Cock J.M. and Motomura, T. (2014). Proteomics analysis of heterogeneous flagella in brown algae (Stramenopiles). **Protist**, 165, 662-675.

Farnham G, Strittmater M, Coelho SM, Cock JM, Brownlee C (2013). Gene silencing in *Fucus* embryos: developmental consequences of RNAi-mediated cytoskeletal disruption. **J. Phycol.** 49: 819-829.

Read, B.A., Kegel, J., Klute, M.J., Kuo, A., Lefebvre S.C., Maumus, F., Mayer, C., Miller, J., Monier, A., Salamov, A., Young, J., Aguilar, M., Claverie, J.-M., Frickenhaus, S., Gonzalez, K., Herman E.K., Lin, Y.-C., Napier, J., Ogata, H., Sarno, A.F., Schmutz, J., Schroeder, D., de Vargas, C., Verret, F., von Dassow, P., Valentin, K., Van de Peer, Y., Wheeler, G., Allen, A.E., Bidle, K., Borodovsky, M., Bowler, C., Brownlee, C., **Cock, J.M.**, Elias, M., Gladyshev, V.N., Groth, M., Guda, C., Hadaegh, A., Iglesias-Rodriguez, D., Jenkins, J., Jones, B.M., Lawson, T., Leese, F., Lindquist, E., Lobanov, A., Lomsadze, A., Lucas, S., Malik, S.-B., Marsh, M.E., Mock, T., Mueller-Roeber, B., Pagarete, A., Parker, M., Probert, I., Quesneville, H., Raines, C., Rensing, S.A., Riano-Pachon, D.M., Richier, S., Rokitta, S., Shiraiwa, Y., Soanes, D.M., van der Giezen, M., Wahlund, T.M., Williams, B., Wilson, W., Wolfe, G., Wurch, L.L., Dacks, J.B., Delwiche, C.F., Dyhrman, S.T., Glöckner, G., John, U., Richards, T., Worden, A.Z., Xiaoyu Zhang, X. and Grigoriev, I.V. (2013). *Emiliania's* pan genome drives the phytoplankton's global distribution. **Nature** (l.f. 42.4), 499:209-213.

Collén J, Porcel B, Carré W, Ball S, Chaparro C, Tonon T, Barbeyron T, Michel G, Noel B, Valentin K, Elias M, Artiguenave F, **Arun A, Aury JM, Barbosa-Neto JF, Bothwell JH, Bouget FY, Brillet L, Cabello-Hurtado F, Capella-Gutierrez S, Charrier B, Cladière L, Cock JM, Coelho SM, Colleoni C, Czjzek M, Da Silva C, Delage L, Denoeud F, Deschamp P, Dittami S, Gabaldón T, Gachon C, Groisillier A, Hervé C, Jabbaric K, Katinka M, Kloareg B, Kowalczyk N, Labadie N, Leblanc C, Lopez P, McLachlan D, Meslet-Cladiere L, Moustafa A, Nehra Z, Nyvall-Collén P, Panaud O, Partensky F, Poulain J, Rensing S, Rousvoal S Samson G, Symeonidi A, Weissenbach J, Zambounis A, Wincker P and Boyen C.** (2013) Genome structure and metabolic features in the red seaweed *Chondrus crispus* shed light on evolution of the Archaeplastida **Proc. Natl. Acad. Sci. USA** 110:5247-52

***Arun, A, Peters, N, Scornet, D, Peters, AF, Cock, JM and Coelho SM** (2013). Non-cell autonomous regulation of the switch between the gametophyte and sporophyte generations of the brown alga *Ectocarpus*. **New Phytologist** 197, 503-510.

L Couceiro, AF Peters, M Le Gac, H Hunsperger, S Mauger, C Destombe, M Cock, S Ahmed, **SM Coelho**, M Valero (2013) The *Ectocarpus* life cycle In the field supports the hypothesis of niche separation between gametophytes and sporophytes. *Phycologia*. 52(4):20-21

Articles de synthèse / revues bibliographiques (4 +5)

Brodie J, XC Cheong, Clerck O, **Cock JM**, **Coelho SM**, Gachon C, Grossman AR, Mock T, Raven J, Smith A, Yoon HS, Bhattacharya D. The Algal Omics Revolution. *Trends in Plant Science* (2017) pii: S1360-1385(17)30105-X.

Brodie, J., Ball, S.G., Bouget, F.-Y., Chan, C.X., De Clerck, O., **Cock, J.M.**, Gachon, C., Grossman, A.R., Mock, T., Raven, J., Saha, M., Smith, A., Vardi, A., Yoon, H.S. and Bhattacharya, D. (2017). Biotic interactions as drivers of algal origin and evolution. *New Phytologist*, in press

Mignerot L, **Coelho SM** (2016). The origin and evolution of the sexes: novel insights from a distant eukaryotic lineage. *CR Biol*. 339:252-257.

Luthringer R, **Cormier A**, **Ahmed S**, **Peters, AF**, **Cock JM**, **Coelho SM** (2014) Sexual dimorphism in the brown algae. *Perspectives in Phycology* 1:11-25.

The *Ectocarpus* Genome Consortium (2012) The Ectocarpus Genome and Brown Algal Genomics. *Advances in Botanical Research* 64:141-184

Cock, JM, **Arun, A.**, **Godfroy, O.**, **Macaisne, N.**, **Strittmatter, M.**, **Peters, A.F.** and **Coelho S.M.** (2012). Genomics of brown algae: current advances and future prospects. *Genes and Genomics*, 34, 1-5.

Cock JM, **Godfroy O**, **Macaisne N**, **Peters AF** and **Coelho SM** (2013). Evolution and regulation of complex life cycles: a brown algal perspective. *Current Opinion in Plant Biology* 17:1-6.

Coelho S.M., **Simon, N.**, **Ahmed, S.**, **Cock, J.M.** and **Partensky, F.** (2013). Ecological and evolutionary genomics of marine photosynthetic organisms. *Molecular Ecology* 22:867-907.

Bogaert KA, **Arun A**, **Coelho S.M.**, **De Clerck O.** (2013) Brown algae as a model for plant organogenesis. *Methods Mol Biol.*; 959:97-125.

Autres articles (articles publiés dans des revues professionnelles ou techniques, etc.)

2. Ouvrages

Monographies et ouvrages scientifiques, éditions critiques, traductions

n/a

Direction / édition scientifique

Series editor, *Advances in Marine Genomics* (JMC), new volume in 2015: **Evolutionary transitions to multicellular life**. Ruiz-Trillo, I. and Nedelcu, A.M. (eds) Springer, Dordrecht, pp. 153-162.

Chapitres d'ouvrage (3)

Bourdareau S, **Mignerot L**, **Heesch S**, **Peters**, **Coelho SM**, **Cock JM**. (2016) Alternation of generations in plants and algae. In *Evolutionary Developmental Biology - A reference guide*. Springer, Netherlands, in press.

Cock JM and Collén J. (2015) Independent emergence of complex multicellularity in the brown and red algae. In: Evolutionary transitions to multicellular life. pp. 335-361 Editors: Trillo, Inaki Ruiz, Nedelcu, Aurora M (Eds.) Springer, Netherlands.

Cock JM, Godfroy O, Strittmatter M, Scornet D, Uji T, Farnham G, Peters AF and Coelho SM (2015). Emergence of *Ectocarpus* as a Model System to Study the Evolution of Complex Multicellularity in the Brown Algae. pp 153-162 in Evolutionary Transitions to Multicellular Life, Editors: Trillo, Inaki Ruiz, Nedelcu, Aurora M (Eds.) Springer, Netherlands.

Thèses publiées / éditées

n/a

3. Colloques / congrès, séminaires de recherche

Éditions d'actes de colloques / congrès

n/a

Articles publiés dans des actes de colloques / congrès

SM Coelho. (2015) Genomic and Evolutionary Features of the Brown Alga *Ectocarpus* UV Sex Chromosomes. Plant and Animal Genome XXIII Conference

JM Cock, A Arun, D Scornet, AF Peters, O Godfroy, A Cormier, (2015) Development of forward genetic and genomic approaches to identify key regulatory genes in the brown algae. *European journal of phycology* 50, 94-94

AP Lipinska, R Luthringer, D Roze, A Cormier, AF Peters, JM Cock, (2015) Unusual features of the pseudoautosomal region of a U/V pair of sex chromosomes. *European journal of phycology* 50, 68-68

Autres produits présentés dans des colloques / congrès et des séminaires de recherche

Cock, J.M. (2017). Brown algal genomics. Global Seaweed Course, Oban, Scotland, 11th May. (Invited speaker).

Cock, J.M. (2017). The *Ectocarpus* genome seven years on: improved gene annotation with isoforms, non-coding genes and more. 8th Annual Meeting of the EFOR Network, Paris, 3rd May. (Invited speaker).

Cock, J.M. (2017). Workpackage 2: Selection, breeding, germplasm and biobanking for industrially important macroalgae. EU BG-01 Bluegrowth project Genialg kick off meeting, Roscoff, 23-24h January.

Cock, J.M. (2017). Major objectives of the genetic approaches that will be used in Genialg. EU BG-01 Bluegrowth project Genialg kick off meeting, Roscoff, 23-24h January.

Cock, J.M., Arun, A., Godfroy, O., Scornet, D., Bourdareau, S., Peters, A.F. and Coelho, S.M. (2017). Genetic regulators of life cycle transitions in the brown alga *Ectocarpus*. Pop Group, Cambridge, 5-7th January.

Lipinska, A., Toda, N., Heesch, S., Mignoret, KL., Avia, K., Peters, A.F., Cock, J.M. and Coelho, S.M. (2017). UV sex chromosome evolution in seaweeds. Pop Group, Cambridge, 5-7th January.

Coelho SM. Origin and evolution of the sexes: new insights from the brown algae. Trajectoires de la génétique 150 ans après Mendel - Académie des Sciences - Paris, 11-13 Septembre 2016 (invited speaker)

Komlan Avia, Susana Coelho, Fiona Lerck, Stéphane Mauger, Gabriel Montecinos, Sylvain Faugeron, Myriam Valero, J. Mark Cock and Pierre Boudry. (2015). QTL mapping to study the genetic basis of growth under

stress conditions of temperature and salinity in the model brown alga *Ectocarpus* sp. Colloque Marine French Connection (MarCo) 16-18 septembre, Montpellier

Komlan Avia, Susana Coelho, Fiona Lerck, Stéphane Mauger, Gabriel Montecinos, Myriam Valero, J. Mark Cock and Pierre Boudry. (2015). QTL mapping to study the genetic basis of growth under stress conditions of temperature and salinity in the model brown alga *Ectocarpus* sp. Congrès Société Phycologique de France. 23-25 septembre, Vannes

Lipinska, A., Luthringer, R., Cormier, A., Peters, A.F., Roze, D., Cock, J.M. and Coelho, S.M. (2015). Unique evolutionary features of the pseudoautosomal region of the *Ectocarpus* UV sex chromosomes. Pop Group, Sheffield, 6-9th January.

Lipinska, A., Cormier, A., Luthringer, R., Peters, A.F., Corre, E., Gachon, C.M.M., Cock, J.M. and Coelho S.M. (2015). Sexual dimorphism and the evolution of sex-biased gene expression in the brown alga *Ectocarpus*. JOBIM meeting 6-10 July Clermont Ferrand, France

Komlan Avia, Susana Coelho, Fiona Lerck, Stéphane Mauger, Gabriel Montecinos, Myriam Valero, J. Mark Cock and Pierre Boudry. (2015). QTL mapping to study the genetic basis of growth under stress conditions of temperature and salinity in the model brown alga *Ectocarpus* sp. ESEB 2015, 10-14 août 2015 Lausanne

Godfroy, O., Scornet, D., Le Corguillé, G., Coelho, S. M. and Cock, J.M.. (2014). Setting-up of a TILLING resource for *Ectocarpus*. *Ectocarpus 2014: Analyses of biological phenomena based on algal genomics*, Kobe, Japan, 28-30th March. (Poster).

Cock, J.M. (2014). Regulation des cycles de vie chez les algues brunes et le rôle écologique des variations de ces cycles de vie. Journée thématique Axe 2 ; Comment intégrer l'ÉCOlogie à l'Evo-Devo ? Marseille, France, 3rd June. (Invited speaker).

Godfroy, O., Uji, T., Peters, A.F., Cock, J.M. and Coelho, S.M. (2014). Identification and characterization of the *Ectocarpus* mutant *distag*. *Ectocarpus 2014: Analyses of biological phenomena based on algal genomics*, Kobe, Japan, 28-30th March.

Cock, J.M., Peters, A.F., Arun, A., Godfroy, O., Strittmatter, M., Scornet, D., Heesch, S., Cho, G.Y., Macaisne, N. and Coelho, S.M. (2014). Genetic regulation of life cycle progression in the brown algae. *Marinexus Plenary Meeting*, Plymouth, UK, 9th-10th April.

Cock, J.M., Peters, A.F., Arun, A., Godfroy, O., Strittmatter, M., Scornet, D., Uji, T., Heesch, S., Cho, G.Y., Macaisne, N. and Coelho, S.M. (2014). Life cycle regulation and complex multicellular development in the brown algae. *Ectocarpus 2014: Analyses of biological phenomena based on algal genomics*, Kobe, Japan, 28-30th March.

Cock, J.M., Peters, A.F., Arun, A., Godfroy, O., Strittmatter, M., Scornet, D., Uji, T., Heesch, S., Cho, G.Y., Macaisne, N. and Coelho, S.M. (2014). Coordinating life cycle regulation and development during the emergence of complex multicellularity in the brown algae. *EFOR meeting*, Paris, France, 12-13th February. (Invited speaker).

Couceiro, L., Peters, A.F., Le Gac, M., Hunsperger, H., Mauger, S., Destombe, C., Cock, J. M., Ahmed, S., Coelho, S.M. and Valero, M. (2014) Niche partitioning between gametophytes and sporophytes in field-collected *Ectocarpus*. *Marinexus. Marinexus Final Plenary Meeting*. Plymouth, United Kingdom (Invited speaker).

Couceiro, L., Peters, A.F., Le Gac, M., Hunsperger, H., Mauger, S., Destombe, C., Cock, J. M., Ahmed, S., Coelho, S.M. and Valero, M. (2014) Niche partitioning between gametophytes and sporophytes in field-collected *Ectocarpus*. 6th International Meeting on the Model Brown Algal *Ectocarpus*. Kobe, Japan.

- Luthringer, R., Cormier, A., Peters, A.F., Corre, E., Cock, J.M. and Coelho, S.M. (2013). Evolution of sexual dimorphism in the brown algae. Société Phycologique de France meeting national, Roscoff, France, 16-18th December.
- Couceiro, L., Peters, A.F., Le Gac, M., Hunsperger, H., Mauger, S., Destombe, C., Cock, J.M., Ahmed, S., Coelho, S.M. and Valero, M. (2013). Niche-partitioning between gametophytes and sporophytes in field-collected *Ectocarpus*. Société Phycologique de France meeting national, Roscoff, France, 16-18th December.
- Couceiro, L., Peters, A.F., Le Gac, M., Hunsperger, H., Mauger, S., Destombe, C., Cock, M., Ahmed, S., Coelho, S.M. & Valero, M. (2013). Niche partitioning between gametophytes and sporophytes in field-collected *Ectocarpus*. 35th Réunion Annuelle du Groupe d'étude de Biologie et Génétique des Populations. Marseille, France
- Hervé, C., Tonon, T., Cock, J.M., Collén, J., Boyen, C., Kloareg, B. and Michel, G. (2013). Plant cell wall evolution: lessons from the genomes of brown and red seaweeds. Société Phycologique de France meeting national, Roscoff, France, 16-18th December.
- Godfroy, O. (2013). Identification and characterisation of a new free floating *Ectocarpus* mutant: distag. Société Phycologique de France meeting national, Roscoff, France, 16-18th December.
- Cock, J.M. (2013). Life cycle regulation in the brown alga *Ectocarpus*. GDRI Diversity, Evolution and Biotechnology of Marine Algae workshop, Ilhabela, Brazil, 28th October-1st November.
- Couceiro, L., Peters, A.F., Le Gac, M., Hunsperger, H., Mauger, S., Destombe, C., Cock, J.M., Ahmed, S., Coelho, S.M. and Valero, M. (2013). The *Ectocarpus* life cycle in the field supports the hypothesis of niche separation between gametophytes and sporophytes. 10th International Phycological Congress 2-7 August, Orlando, USA.
- Luthringer, R., Cormier, A., Corre, E., Cock, J.M. and Coelho, S.M. (2013). Sexual dimorphism in the brown algae. Journées André Picard Roscoff 18-19 Mars (invited speaker)
- Cock, J.M., Scornet, D., Arun, A., Godfroy, O., Strittmatter, M., Macaisne, N., Uji, T., Heesch, S., Cho, G.Y., Corre, E., Peters, A.F. and Coelho, S.M. (2013). Genetic regulation of life cycle progression in the model brown alga *Ectocarpus*. Quatrième rencontre des journées André Picard, Roscoff, France 18-19th March 2013.
- Farnham, G., Strittmatter, M., Coelho, S.M., Cock, J.M. and Brownlee, C. (2013). Cytoskeletal disruption via RNA interference-mediated gene silencing in *Fucus serratus* embryos. Société Phycologique de France meeting national, Roscoff, France, 16-18th December. (Poster).
- Cormier, A., Bothwell, J., Cock, J. M., Corre, E. and Coelho, S. M. (2013). Sex determination and differentiation in the brown alga *Ectocarpus*. Société Phycologique de France meeting national, Roscoff, France, 16-18th December. (Poster).
- Mauger, S., Cock, J.M. and Valero, M. (2013) Development of expressed sequence tag-derived microsatellite markers (EST-SSR) for *Saccharina latissima* studies. Investissements Avenir project Idealg annual meeting, Roscoff, France, 22-23rd October. (Poster).
- Farnham, G., Strittmatter, M., Coelho, S.M., Cock, J.M. and Brownlee, C. (2013). Development of RNA interference-mediated gene silencing in *Fucus serratus* embryos. Annual Meeting of the British Phycological Society, Belfast, UK. (Poster).
- Ahmed, S., Cock, J.M., Peters, A.F. and Coelho, S.M. (2013). Patterns of nucleotide diversity for sex linked, pseudoautosomal, and autosomal genes in the model brown algae *Ectocarpus*. Conférence Jacques

Monod: Avancées récentes sur l'évolution du sexe et des systèmes génétiques, Roscoff, France, 22nd-23rd May 2013. (Poster).

Cormier, A., Bothwell, J., Cock, J. M., Corre, E. and Coelho, S. M. (2013). Identification of the female sex locus in the brown alga *Ectocarpus*. JOBIM 2013, Toulouse, France 1st-4th July 2013. (Poster).

Couceiro, L., Peters, A.F., Le Gac, M., Hunsperger, H., Mauger, S., Destombe, C., Cock, J. M., Ahmed, S., Coelho, S.M. & Valero, M. (2013) Niche partitioning between gametophytes and sporophytes in field-collected *Ectocarpus*. 5th Young Scientists Day. Roscoff, France

Andres, G., Cormier, A., Lorre-Guidt, M., Hoebeke, M., Groc, M., Dru P. and Caron C. (2013). EMBRC-France e-infrastructure. JOBIM 2013, Toulouse, France 1st-4th July 2013. (Poster).

C. Caron, W. Carré, A. Cormier, S. Derozier, F. Giacomoni, O. Inizan, G. Le Corguillé, A. Lermine, S. Maman, P. Pericard and F. Samson (2013). Toward a cyber Galaxy? JOBIM 2013, Toulouse, France 1st-4th July 2013. (Poster).

N. Guilhot, S. Theil, F. Choulet, C. Caron, A. Cormier, C. Feuillet and P. Leroy (2013). TriAnnot : un outil bioinformatique puissant pour l'identification de gènes d'intérêt agronomique dans les génomes des plantes. JOBIM 2013, Toulouse, France 1st-4th July 2013. (Poster).

4. Développements instrumentaux et méthodologiques

Prototypes et démonstrateurs

n/a

Plateformes et observatoires

n/a

5. Produits et outils informatiques

Logiciels

n/a

Bases de données / cohortes

n/a

Corpus

n/a

Outils présentés dans le cadre de compétitions de solveurs

n/a

Outils d'aide à la décision

n/a

6. Brevets, licences et déclarations d'invention

n/a

7. Rapports d'expertises techniques, produits des instances de normalisation

n/a

8. Produits des activités didactiques

n/a

Ouvrages

n/a

E-learning, moocs, cours multimedia, etc.

n/a

9. Produits destinés au grand public

Émissions radio, TV, presse écrite

- Le Telegramme 21/11/2015
- Le Telegramme "Portraits" 20 novembre 2015
- Ouest France 21/11/2015
- Sciences Ouest n. 325 Novembre 2014 "Portraits"

Produits de vulgarisation : articles, interviews, éditions, vidéos, etc.

Video abstract created for the article 'Multiple gene movements into and out of haploid sex chromosomes' promoted on the Genome Biology website and social media.

Short film about the research done by the Algal Genetics. Film directed by Vincent Melcion, conceived by Marielle Guichoux and Valérie Deborde, produit by the CNRS (<http://www.dailymotion.com/video/x3c7ezl>)

Development of a board game "le sexe des algues" in collaboration with Christophe Destombe (UMI Biodiversity and evolution of marine algae) for presentation in primary schools

J.M. Cock, T. Smyth and J. Bishop (2014) "Marinexus - Our shared seas." The Marine Biologist, Autumn issue, 2014.

The Interreg project Marinexus (2010-2014), coordinated by JMC had a large outreach program (about a third of the 5 M€ budget) aimed at informing schoolchildren and the general public about the oceans and human impact on these systems. Activities included equipping a laboratory in a travelling bus, which

visited many schools in the region, many workshops were organised for children on Brittany Ferries during France-England voyages and a large number of other events organised for the general public.

Information flyer describing technology transfer from the *Ectocarpus* genome project produced by the EU project Marine Genomics for Users (MG4U) (2013) (JMC)

Produits de médiation scientifique

Macaisne, N. and Cock, J.M. (2017). The people behind the papers. Article in The Node (<http://thenode.biologists.com/people-behind-papers-12/interview/>) (JMC)

Organisation/animation of the workshop « La vie secrète des grandes algues » “Fête de la science” (every year since 2006) (SMC)

Organization/animation of workshops on “Diversity of algae living in our shores” in local primary schools (every year) (SMC)

La nuit des chercheurs, Oceanopolis Brest 28 septembre 2012 atelier/exposition « le sexe des algues » (JMC)

Débats science et société

n/a

10. Autres produits propres à une discipline

Créations artistiques théorisées

n/a

Mises en scènes

n/a

Films

n/a

II. ACTIVITÉS DE RECHERCHE ET INDICES DE RECONNAISSANCE

La liste de ces activités n'a pas à être exhaustive. On mettra en évidence les activités les plus significatives en termes de rayonnement et d'attractivité, d'interaction avec l'environnement et d'implication dans la formation par la recherche.

1. Activités éditoriales

Participation à des comités éditoriaux (revues, collections)

Joint editor-in-chief for *Perspectives in Phycology* (2014-present, JMC).

Associate editor for the **Journal of Phycology** (2012-present, JMC).

Editorial board member for **Marine Genomics** (2012-present, JMC).

Editorial board member for the **Journal of the Marine Biological Association** (2015-present, JMC).

Editorial Board Member for **Plant Signalling and Behaviour** (2010-2015, SMC)

Direction de collections et de séries

Book series editor, "**Advances in Marine Genomics**", Springer (JMC)

2. Activités d'évaluation

Responsabilités au sein d'instances d'évaluation

Member of the ANR Evaluation Committee (CE 13, 2017, SMC).

Member of the Agence National de la Recherche (ANR) committee "Accueil des Chercheurs de Haut Niveau" (@RAction) for scientists moving to France from overseas (2014, JMC).

Évaluation d'articles et d'ouvrages scientifiques

Referee for **Nature Genetics** (JMC), **Developmental Cell** (JMC), **Nature Communications** (JMC), **PLoS Biology** (JMC, SMC), **PLoS Genetics** (JMC, SMC), **Genome Biology** (JMC), **Science Reports** (SMC), **Molecular Biology and Evolution** (JMC), **Trends in Plant Science** (JMC), **Evolution** (JMC), **Molecular Biology and Evolution** (SMC), **New Phytologist** (SMC), **Plant Signalling and Behaviour** (SMC), **Journal European Journal of Phycology** (JMC, SMC), **Journal of Applied Phycology** (JMC, SMC), **Journal of Phycology** (SMC), **PLoS One** (JMC), **BMC Genomics** (JMC, SMC), **Marine Genomics** (JMC), **Marine Biology** (SMC), **Marine Biotechnology** (JMC), **Non-coding RNA** (JMC), **Frontiers in Plant Science** (JMC), **Planta** (JMC), **Journal of Molecular Evolution** (JMC), **Algological Studies** (JMC), **Journal of Molecular Evolution** (JMC).

Évaluation de laboratoires (type Hceres)

Five-year performance review for a scientist at the **Danforth Plant Science Center**, USA (JMC),

Évaluation de projets de recherche

Grant Reviews for **NSF USA** (National Science Foundation; SMC), **Fondecyt** Program, Chile (JMC), **FWO** The Netherlands (Flanders Research Foundation; SMC, JMC), **FCT** (Fundação para a Ciencia e Tecnologia; SMC) Portugal, **CNCS Romania** (National Research Council; SMC), **ANR** (France; SMC, JMC).

3. Activités d'expertise scientifique

Activités de consultant

Member of a working group for the **ITMO** (Institut Thématique Multi-Organisme) Génétique, Génomique et Bioinformatique (2009 - present, JMC)

Participation à des instances d'expertises (type Anses) ou de normalisation

n/a

Expertise juridique

n/a

4. Organisation de colloques / congrès

Organization of the symposium 'Evolution of life cycles' at the **European Evo-devo Meeting**, Uppsala, Sweden, July 2016 (JMC, SMC)

Co-organisation of the **international Workshop 'Sex chromosome evolution'** La Sage, CH, June 2016 (SMC with Nicolas Perrin, Univ. Lausanne)

Co-chair of a session at the **European Phycological Congress** 24-28th August 2015, London, UK (JMC)

Organisation Symposium sex chromosome evolution **ESEB Meeting** Lausanne August 2015 (SMC)

Organising Committee for the sixth international **Ectocarpus meeting** "Ectocarpus 2014: Analyses of biological phenomena based on algal genomics" 28-30th March 2014, Kobe, Japan (JMC)

Member of the organising committee of the **Journées de la Société Phycologique de France** Roscoff 'Quelles perspectives pour la Phycologie' 16 au 18 December 2013, Roscoff (SMC)

Co-chair of a session at the **Tenth International Phycological Congress** 4-10th August 2013, Orlando, USA (JMC)

Member of the organizing committee of the **French - Brazilian meeting on Marine Science** "Building the Marine Science" 3-8th November 2013 in Buzios, Brasil (500 participants) (SMC)

5. Post-doctorants et chercheurs accueillis

On précisera ici les faits observables pertinents pour l'évaluation (nombre, publications, financements ...)

2016-2018 **Nick Toda** 'Genomic analysis of sex chromosomes across several brown algal lineages' ERC SEXSEA

Publications (2013-2017):

Lipinska A, **Toda N**, Heesch S, Peters A, Cock JM, Coelho SM. (2017) Multiple gene movements into and out of haploid sex chromosomes. **Genome Biology** (in press)

2015-2018 **Svenja Heesch** 'Genetic maps for *Sacchoriza* sp. and *Fucus* sp.'

Publications (2013-2017):

Lipinska A, **Toda N**, Heesch S, Peters A, Cock JM, Coelho SM. (2017) Multiple gene movements into and out of haploid sex chromosomes. **Genome Biology** (in press)

- 2015-2017 **Marie-Mathilde Perrineau** “Development of a TILLING population as a reverse genetics tool for *Ectocarpus*” ERC SEXSEA and Région de Bretagne
- Publications (2013-2017):**
- Macaisne N, Liu F, Scornet D, Peters AF, Lipinska A, **Perrineau M**, Henry A, Strittmatter M, Coelho SM, Cock JM. (2017) The *Ectocarpus IMMEDIATE UPRIGHT* gene encodes a member of a novel family of cysteine-rich proteins with an unusual distribution across the eukaryotes. **Development** doi: 10.1242/dev.141523
- Cormier A, Avia A, Sterck L, Derrien T, Wucher V, Andres G, Monsoor M, Godfroy O, Lipinska A, **Perrineau MM**, Van De Peer Y, Hitte C, Corre E, Coelho SM, Cock JM (2017) Re-annotation, improved large-scale assembly and establishment of a catalogue of non-coding loci for the genome of the model brown alga *Ectocarpus*. **New Phytologist** 14:219-232
- 2014-2016 **Komlan Avia** “QTL mapping in the model brown alga *Ectocarpus*”, ANR IDEALG.
- (2014) Sexual dimorphism in the brown algae. **Perspectives in Phycology** 1:11-25.
- Publications (2013-2017):**
- Avia K**, Coelho SM, Montecinos G, Cormier A, Lerck F, Mauger S, Faugeron S, Valero M, Cock JM and Boudry P (2017) High-density genetic map and identification of QTLs for responses to high temperature and low salinity stresses in the model alga *Ectocarpus*. **Sci. Reports** 7:43241.
- Cormier A, **Avia A**, Sterck L, Derrien T, Wucher V, Andres G, Monsoor M, Godfroy O, Lipinska A, Perrineau MM, Van De Peer Y, Hitte C, Corre E, Coelho SM, Cock JM (2017) Re-annotation, improved large-scale assembly and establishment of a catalogue of non-coding loci for the genome of the model brown alga *Ectocarpus*. **New Phytologist** 14:219-232
- 2014-2014 **Fuli Liu** “Characterisation of the *imm* mutant”, China Scholarship Council.
- Publications (2013-2017):**
- Cock JM, Liu F, Duan D, Bourdareau S, Lipinska A, Coelho SM, Tarver JE (2017). Rapid evolution of microRNA loci in the brown algae. **Genome Biology and Evolution** 9:740-749
- Macaisne N, Liu F, Scornet D, Peters AF, Lipinska A, Perrineau M, Henry A, Strittmatter M, Coelho SM, Cock JM. (2017) The *Ectocarpus IMMEDIATE UPRIGHT* gene encodes a member of a novel family of cysteine-rich proteins with an unusual distribution across the eukaryotes. **Development** doi: 10.1242/dev.141523
- 2013-2019 **Agnieszka Lipinska** “Analyses of sex biased gene expression in the brown algae”. ANR JC/JC; ERC SEXSEA.
- Publications (2013-2017, *joint first authors):**
- Lipinska A**, Toda N, Heesch S, Peters A, Cock JM, Coelho SM. (2017) Multiple gene movements into and out of haploid sex chromosomes. **Genome Biology** (in press)
- Cock JM, Liu F, Duan D, Bourdareau S, **Lipinska A**, Coelho SM, Tarver JE (2017). Rapid evolution of microRNA loci in the brown algae. **Genome Biology and Evolution** 9:740-749

Evolution 9:740-749

Macaisne N, Liu F, Scornet D, Peters AF, Lipinska A, Perrineau M, Henry A, Strittmatter M, Coelho SM, Cock JM. (2017) The *Ectocarpus IMMEDIATE UPRIGHT* gene encodes a member of a novel family of cysteine-rich proteins with an unusual distribution across the eukaryotes. **Development** doi: 10.1242/dev.141523

Cormier A, Avia A, Sterck L, Derrien T, Wucher V, Andres G, Monsoor M, Godfroy O, Lipinska A, Perrineau MM, Van De Peer Y, Hitte C, Corre E, Coelho SM, Cock JM (2017) Re-annotation, improved large-scale assembly and establishment of a catalogue of non-coding loci for the genome of the model brown alga *Ectocarpus*. **New Phytologist** 14:219-232

Lipinska A, Ahmed S, Peters AF, Faugeron S, Cock JM, Coelho SM (2015) Development of PCR-based markers to determine the sex of kelps. **Plos One** 10(10):e0140535. doi: 10.1371/journal.pone.0140535.

Luthringer R*, Lipinska A*, Roze D, Cormier A, Peters A, Cock JM, Coelho SM (2015) The pseudoautosomal regions of the U/V sex chromosomes of the brown alga *Ectocarpus* exhibit unusual features. **Mol Biol Evol** doi: 10.1093/molbev/msv173

Lipinska A*, Cormier A*, Luthringer R, Peters AF, Corre E, Gachon CMM, Cock JM, Coelho SM. (2015) Sexual dimorphism and the evolution of sex-biased gene expression in the brown alga *Ectocarpus*. **Mol Biol Evol.** (I.F. 13.649) doi: 10.1093/molbev/msv049

2010-2014 Nicolas Macaisne "Analyses of *Ectocarpus* life cycle mutants". ANR Bi-cycle.

Publications (2013-2017):

Macaisne N, Liu F, Scornet D, Peters AF, Lipinska A, Perrineau M, Henry A, Strittmatter M, Coelho SM, Cock JM. (2017) The *Ectocarpus IMMEDIATE UPRIGHT* gene encodes a member of a novel family of cysteine-rich proteins with an unusual distribution across the eukaryotes. **Development** doi: 10.1242/dev.141523

The *Ectocarpus* Genome Consortium (2012) The *Ectocarpus* Genome and Brown Algal Genomics. **Advances in Botanical Research** 64:141-184

Cock, JM, Arun, A., Godfroy, O., Macaisne, N., Strittmatter, M., Peters, A.F. and Coelho S.M. (2012). Genomics of brown algae: current advances and future prospects. **Genes and Genomics**, 34, 1-5.

Cock JM, Godfroy O, Macaisne N, Peters AF and Coelho SM (2013). Evolution and regulation of complex life cycles: a brown algal perspective. **Current Opinion in Plant Biology** 17:1-6.

6. Interactions avec les acteurs socio-économiques

Contrats de R&D avec des industriels

n/a

Bourses Cifre

n/a

Créations de laboratoires communs avec une / des entreprise(s)

n/a

Création de réseaux ou d'unités mixtes technologiques

Coordination of the **Groupe de Recherche International (GDRI)** "Diversity, Evolution and Biotechnology of Marine Algae" (DEBMA) 2013-2016 and renewed for four years 2017-2020. The GDRI DEBMA is a network of 24 laboratories in Chile, Brazil and France that work on a common project aimed at improving our understanding of how marine algae (macro- and micro-algae) function within their ecosystems and at developing tools for sustainable biotechnological exploitation of this group of organisms. The GDRI DEBMA is linked with the Franco-Chilean International Mixed Laboratory (UMI) "Evolutionary Biology and Ecology of Algae". (JMC)

Créations d'entreprises, de start-up

n/a

7. Contrats de recherche financés par des institutions publiques ou caritatives

Contrats européens (ERC, H2020, etc.) et internationaux (NSF, JSPS, NIH, Banque mondiale, FAO , etc.)

ERC Starting Grant (1.5 M€) SEXSEA 2015-2020 "Origin and evolution of the sexes and reproductive systems: novel insights from a distant eukaryotic lineage" (SMC)

Workpackage coordinator for the **EU project Genialg** (BG-01 BlueGrowth H2020) 2017-2020 "GENetic diversity exploitation for Innovative macro-ALGal biorefinery" (JMC)

Project coordinator for the **EU Interreg IVa project**, 2010-2014 (5 M€). "Marinexus. Our shared sea: mechanisms of ecosystem change in the western channel" (JMC)

Contrats nationaux (ANR, PHRC, FUI, INCA, etc.)

France Genomique large-scale sequencing project "Phaeoexplorer", 2016- . "Exploring the evolution of biological complexity in the brown algae through the establishment of a multi-scale genomic data resource". Project coordinator (JMC)

ANR Jeune Chercheur 2013-2016 (230 k€) SEXSEAWEEED ANR-12-JSV7-0008 "Genetic sex determination and evolution of sexual dimorphism in seaweeds" Project coordinator (SMC)

ANR Blanc, 2011-2013 (370 k€). BI-CYCLE "Investigation of the life cycle of the brown alga *Ectocarpus siliculosus*" Project coordinator (JMC)

Emergence UPMC, 2010-2013 (140 k€) ECTOSEX "Genomic analysis of a primitive sex-determination system in the brown alga *Ectocarpus*" Project coordinator (SMC)

Contrats avec les collectivités territoriales

Région Bretagne Postdoc contract 2016 - 2017 "EctoTILL : Développement d'une plateforme de génétique inverse pour l'algue brune *Ectocarpus* sur la base de NGS TILLING et d'ecoTILLING". Project Coordinator. (JMC)

Contrats financés dans le cadre du PIA

n/a

Contrats financés par des associations caritatives et des fondations (ARC, FMR, FRM, etc.)

n/a

8. Indices de reconnaissance

Prix

Prix Tregouboff Academie des Sciences (SMC)

Distinctions

Medaille de Bronze CNRS (SMC)

Responsabilités dans des sociétés savantes

n/a

Invitations à des colloques / congrès à l'étranger, séjours dans des laboratoires étrangers

Coelho SM 'Origin and evolution of the sexes: new insights from the brown algae' French Phycological Society Meeting, National History Museum, Paris, March 2017 (keynote speaker)

Cock, J.M., Arun, A., Godfroy, O., Scornet, D., Bourdareau, S., Peters, A.F. and Coelho, S.M. (2016). Genetic regulation of the haploid-diploid life cycle of the brown alga *Ectocarpus*. Euro Evo Devo meeting, Uppsala, Sweden, 26-29th July. (Invited speaker).

Coelho SM 'Sex chromosome evolution in the brown algae' International Workshop 'Sex chromosome evolution' La Sage, CH, June 2016 (invited speaker)

Cock, J.M., Arun, A., Godfroy, O., Scornet, D., Bourdareau, S., Peters, A.F. and Coelho, S.M. (2016). Regulation of developmental programs during life cycle progression in the model brown alga *Ectocarpus*. Royal Society meeting "Into the genome: advances in the world of algal genomics", Newport Pagnell, UK, 8-9th June. (Invited speaker).

Coelho SM. Sex on the beach: algae shedding light into the evolution and regulation of sexual reproduction. Young Researchers Meeting, Institut Pasteur Paris 18-20 Mai 2016 (keynote speaker)

Coelho SM Algal genetics: *Ectocarpus* and beyond. Exploring the scope of collaborations in marine biology and biotechnology between France and India Meeting. Bangalore, India 5-11 March 2016. (invited speaker)

- Lipinska, A., Luthringer, R., Cormier, A., Peters, A.F., Roze, D., Cock, J.M. and Coelho, S.M. (2015) Genomic and evolutionary features of the brown alga *Ectocarpus* UV sex chromosomes. Plant and Animal Genome Meeting, San Diego, USA 11-15 January (invited speaker)
- Cock, J.M., Arun, A., Scornet, D., Peters, A.F., Godfroy, O., Cormier, A., Macaisne, N., Uji, T., Ahmed, S. and Coelho, S.M. (2015). Development of forward genetic and genomic approaches to identify key regulatory genes in the brown algae. European Phycological Congress, London, UK, 24-28th August. (Invited speaker).
- Cock, J.M. (2015). Using *Ectocarpus* genomics to investigate the emergence of complex multicellularity in the brown algae. Phycological Society of America Annual Meeting, Philadelphia, USA, 9-13th August. (Invited speaker).
- Cock, J.M. (2015). Genomic and genetic approaches to investigate the emergence of complex multicellularity in the brown algae. Marine Genomics 100+ Meeting, Seoul, South Korea, 23rd July. (Invited speaker).
- Cock, J.M. (2015). Molecular factors underlying the emergence of complex multicellularity in the brown algae. British Society for Protist Biology meeting, Huddersfield, UK, 15-16th April. (Invited speaker).
- Coelho SM L'évolution des sexes : ce que les algues nous apprennent. Journées de l'Académie des Sciences en Bretagne. Roscoff, 12 Mai 2014 (invited speaker)
- Coelho SM (2014) Evolution of the sexes: lessons from the brown algae. *Ectocarpus* 2014. Kobe, Japan. 28 Feb-2 March (Plenary speaker)
- Cock, J.M. (2014). Life cycle regulation and the emergence of complex multicellularity in the brown algae. 53rd annual Northeast Algal Symposium, Salve Regina University, Rhode Island, USA, 25-27th April. (Plenary speaker).
- Coelho SM. Birds do it, bees do it... and seaweeds do it too: sex determination in the model brown alga *Ectocarpus*. Meeting of the GDRi Diversity, Evolution and Biotechnology of Marine Algae, Ilha Bela, Brasil 26-29 October 2013. (invited speaker)
- Cock, J.M., Peters, A.F., Arun, A., Godfroy, O., Strittmatter, M., Scornet, D., Uji, T., Heesch, S., Cho, G.Y., Macaisne, N. and Coelho, S.M. (2013). Life cycle regulation and the emergence of complex multicellularity in the brown algae. EMBO meeting on Comparative Genomics of Eukaryotic Microorganisms: Complexity Patterns in Eukaryotic Genomes, Sant Feliu de Guixols, Spain, 19-24th October. (Invited speaker).
- Cock, J.M., Peters, A.F., Arun, A., Godfroy, O., Strittmatter, M., Scornet, D., Uji, T., Heesch, S., Cho, G.Y., Macaisne, N. and Coelho, S.M. (2013). Regulation of multicellular development during the life cycle of the model brown alga *Ectocarpus*. ICREA Conference on the Evolution of Multicellularity, Barcelona, 1st-2nd October. (Invited speaker).