



Nombres:

**NICOLÁS SIMÓN DOMINIQUE**

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Apellido:

**GUILIANI**

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Contacto (Opcional):

[nguilian@uchile.cl](mailto:nguilian@uchile.cl)

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Título Profesional o Grado Académico (incluya el año de obtención):

**DOCTOR EN MICROBIOLOGÍA E INGENIERIA GENETICA, UNIVERSIDAD DEL MEDITERRANEO, MARSELLA, FRANCIA, 1996**

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Estudios de Postgrado o Especialización (institución donde lo obtuvo y año de obtención):

**EGRESADO DEL INSTITUTO DE CIENCIAS POLITICAS, UNIVERSIDAD DE CHILE, SANTIAGO, CHILE, 2002**

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Actividad Actual e Institución en la cual trabaja:

**PROFESOR ASOCIADO DE LA UNIVERSIDAD DE CHILE. DEPARTAMENTO DE BIOLOGÍA, CONSEJERO DE FACULTAD. SENADOR DE LA UNIVERSIDAD DE CHILE.**

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Reseña de su actividad laboral actual:

Actualmente nuestro laboratorio se ha enfocado en analizar y caracterizar los mecanismos moleculares involucrados en la formación de biopelículas en bacterias acidófilas que participan en el proceso industrial de biolixiviación. En este marco y con el apoyo de proyectos Fondecyt Regular y Conicyt-CNRS, estamos estudiando el sistema “quorum sensing” y la vía del c-di-GMP en diferentes bacterias del genero

*Acidithiobacillus*. Nuestra investigación ha permitido la formación de varios estudiantes de pregrado y postgrado (PhD y MSc).

Número de tesis:

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## PUBLICACIONES ISI EN LOS ULTIMOS 10 AÑOS

1. Banderas A, **Guiliani N.** (2013) Bioinformatic prediction of gene functions regulated by quorum sensing in the bioleaching bacterium *Acidithiobacillus ferrooxidans*. Int J Mol Sci. 14:16901-16916.
2. Zúñiga A, Poupin MJ, Donoso R, Ledger T, **Guiliani N**, Gutiérrez RA, González B. (2013) Quorum sensing and indole-3-acetic acid degradation play a role in colonization and plant growth promotion of *Arabidopsis thaliana* by *Burkholderia phytofirmans* PsJN. Mol Plant Microbe Interact. 26:546-553.
3. González A., Bellenberg S., Mamani S., Ruiz L., Echeverría A., Soulère L., Doutheau A., Demergasso C., Sand W., Queneau Y., Vera M., **Guiliani N.** (2013) AHL signalling molecules with a large acyl chain enhance biofilm formation on sulfur and metal sulfides by the bioleaching bacterium *Acidithiobacillus ferrooxidans*. Appl. Microbiol. Biotechnol. 97:3729-3737.
4. Bellenberg, S., Barthen, R., Vera M., **Guiliani N.**, Sand, W. (2013) Biofilm formation, communication and interactions of mesophilic leaching bacteria during pyrite oxidation. Adv. Mat. Res. 825: 107-110.
5. Mamani S., Denis Y., Moinier D., Sabbah M., Soulère L., Queneau, Y., Bonnefoy, V., **Guiliani, N.** (2013) Characterization of the quorum sensing regulon in *Acidithiobacillus ferrooxidans*. Adv. Mat. Res. 825: 127-132.
6. Diaz M., Copaja S., **Guiliani N.** (2013) Functional analysis of c-di-GMP pathway in biomining bacteria *Acidithiobacillus thiooxidans*. Adv. Mat. Res. 825: 133-136.
7. González A., Bellenberg S., Mamani S., Ruiz L., Echeverría A., Soulère L., Doutheau A., Demergasso C., Sand W., Queneau Y., Vera M., **Guiliani N.** (2012) AHL signalling molecules with a large acyl chain enhance biofilm formation on sulfur and metal sulfides by the bioleaching bacterium *Acidithiobacillus ferrooxidans*. Appl. Microbiol. Biotechnol. DOI: 10.1007/s00253-012-4229-3.

8. Ruiz L.M., M. Castro, A. Barriga, C.A. Jerez, **N. Guiliani (2012)** The extremophile *Acidithiobacillus ferrooxidans* possesses a c-di-GMP signalling pathway that could play a significant role during bioleaching of minerals. *Let. Appl. Microbiol.* **54**:133-139.
9. Chávez F.P., C. Lagos, M. Reyes-Parada, **N. Guiliani**, C.A. Jerez (2011) Polyphosphate Synthesis as a Target for Novel Antibiotics. *Current Enzyme Inhibition.* **7**:163-168.
10. Castro M. L.M. Ruiz, A. Barriga, C. A. Jerez, D. Holmes and **N. Guiliani\*** (2009) C-di-GMP pathway in biomining bacteria. *Adv. Mater. Res. Vols. 71-73.* pp 223-226. ISSN 1022-6680.
11. Ruiz L.M., Valenzuela S., González A., Frezza M., Soulère L., Rohwerder T., Queneau Y., Doutheau A., Sand W., Jerez C.A., **Guiliani, N. (2008)**. AHL communication is a widespread phenomenon in *A. ferrooxidans* species and seems to be involved in mineral-adhesion efficiency. *Hydrometallurgy.* **94**:133-137.
12. Galleguillos, P., Remonsellez, F., Galleguillos, F., **Guiliani, N.**, Castillo, D., Demergasso, C., (2008). Identification of differentially expressed genes in an industrial bioleaching heap processing low-grade copper sulphide ore elucidated by RNA arbitrarily primed polymerase chain reaction. *Hydrometallurgy.* **94**: 148-154.
13. Soulère L., **Guiliani N.**, Queneau Y., Jerez C.A. and Doutheau A. (2008). Molecular insights into quorum sensing in *Acidithiobacillus ferrooxidans* bacteria through a molecular modelling study of the transcriptional regulator AfeR and of the binding mode of long-chain acyl homoserine lactones. *Journal of Molecular Modeling.* **14**:599-606.
14. Frezza M., Soulère L., Reverchon S., **Guiliani N.**, Jerez C.A., Queneau Y. and Doutheau A. (2008) Synthetic homoserine lactone derived sulfonyl ureas as Quorum Sensing inhibitors in *Vibrio fischeri* bacteria. *Bioorg. Med. Chem* **16**:3550-3556.
15. Vera M., Pagliai, F., **Guiliani, N.**, Jerez C.A. (2008) The chemolithoautotroph *Acidithiobacillus ferrooxidans* can survive under phosphate limiting conditions by the expression of a C-P lyase operon that allows it to grow in phosphonates *Appl. Environ. Microbiol.* **74**:1829-1835.
16. Lina M. Ruiz, A. Gonzalez, M. Frezza, L. Soulere, Y. Queneau, A. Doutheau, T. Rohwerder, W. Sand, C. A. Jerez and **N. Guiliani (2007)** Is the quorum sensing type AI-1 system of *Acidithiobacillus ferrooxidans* involved in its attachment to mineral surfaces? *Adv. Mater. Res. Vols. 20-21.* pp 345-349.

17. P. Galleguillos, V. Zepeda<sup>1</sup>, F. Galleguillos, D. Castillo, **N. Guiliani**, F. Remonsellez, E. Ortiz and C. Demergasso (2007) Differential genetic expression in heap bioleaching of low-grade copper sulphide ore at Escondida Mine, Chile. *Adv. Mater. Res. Vols. 20-21*. pp 435-438.
18. Lina M. Ruiz, W. Sand, C. A. Jerez and **N. Guiliani\*** (2007) C-di-GMP pathway in *Acidithiobacillus ferrooxidans*: analysis of putative diguanylate cyclases (DGCs) and phosphodiesterases (PDEs) bifunctional proteins. *Adv. Mater. Res. Vols. 20-21*. pp 551-556.
19. VALENZUELA, L., CHI, A., BEARD, S., ORELL, A., **GUILIANI, N.**, SHABANOWITZ, J., HUNT, DF. And JEREZ, C.A. (2006). Genomics, metagenomics and proteomics in biomining microorganisms. *Biotechnology Advances* 24: 195-209.
20. FARAH, C., VERA, M., MORIN, D., HARAS, D., JEREZ, C.A. and **GUILIANI, N.\*** (2005). Evidence for a functional quorum-sensing type AI-1 system in the extremophilic bacterium *Acidithiobacillus ferrooxidans*. *Applied and Environmental Microbiology* 71: 7033-7040.
21. RAMIREZ, P., **GUILIANI, N.**, VALENZUELA, L., BEARD, S. and JEREZ, C.A. (2004). Differential protein expression during growth of *Acidithiobacillus ferrooxidans* on ferrous iron, sulfur compounds, or metal sulfides. *Applied and Environmental Microbiology* 70: 4491-4498.
22. VERA, M., **GUILIANI, N.** and JEREZ, C.A. (2003). Proteomic and genomic analysis of the phosphate starvation response of *Acidithiobacillus ferrooxidans*. *Hydrometallurgy* 71: 125-132.
23. RAMIREZ, P., TOLEDO, H., **GUILIANI, N.** and JEREZ, C.A. (2002). An exported rhodanese-like protein is induced during growth of *Acidithiobacillus ferrooxidans* in metal sulfides and different sulfur compounds. *Applied and Environmental Microbiology* 68: 1837-1845.
24. CARDONA, S., REMONSELLEZ, F., **GUILIANI, N.** and JEREZ, C.A. (2001). The glycogen-bound polyphosphate kinase from *Sulfolobus acidocaldarius* is actually a glycogen synthase. *Applied and Environmental Microbiology* 67: 4773-4780.
25. **GUILIANI, N.** and JEREZ, C.A. (2000). Molecular cloning, sequencing, and expression of omp-40, the gene coding for the major outer membrane protein from the acidophilic bacterium *Thiobacillus ferrooxidans*. *Applied and Environmental Microbiology* 66: 2318-2324.
26. LIU, Z.Y., **GUILIANI, N.**, APPIA-AYME, C., BORNE, F., RATOUCHNIAK, J. and BONNEFOY, V. (2000). Construction and characterization of a recA

mutant of *Thiobacillus ferrooxidans* by marker exchange mutagenesis.  
Journal of Bacteriology 182: 2269-2276.

## **PROYECTOS ULTIMOS 10 AÑOS**

2012 Quorum Sensing system and c-di-GMP pathway in biomining bacteria  
(Part II): time for gene specific mutagenesis, a challenging outlook

### **FONDECYT**

Investigador responsable

Duración: 3 años

2012 Manipulation of Quorum Sensing systems in bioleaching bacteria: Influences on  
biofilm formation and extracellular polymeric substances (EPS) production.

### **DAAD (DRI\_Conicyt)**

Investigador responsable

Duración: 2 años

2009 An interdisciplinary challenge at the Chemical/Biology/Biotechnology frontier.

### **CNRS-CONICYT (DRI\_Conicyt)**

Investigador responsable

Duración: 3 años

2008 Quorum sensing y c-di-GMP pathway en microorganismos biomineros.

### **FONDECYT**

Investigador responsable

Duración: 4 años

2006 Estudio de la inhibición del quorum sensing afeIR en la bacteria extremofila  
*Acidithiobacillus ferrooxidans*.

### **ECOS-CONICYT ((DRI\_Conicyt))**

Investigador responsable

Duración: 3 años

2004 Estudio Del "Quorum Sensing" de Tipo AI-1 Mediado por el Par Genico *afeR/afel* en la bacteria extremofila acidofila *Acidithiobacillus ferrooxidans*.

**FONDECYT**

Investigador responsable

Duración: 4 años

2000 Metabolismo de los Polifosfatos en Microorganismos Extremofilos: Implicaciones Fisiologicas, Evolutivas y Biotecnologicas.

**FONDECYT**

Co-investigador

Duración: 3 años

1996 Genetic and biochemical characterization of outer membrane proteins induced by growth of *Thiobacillus ferrooxidans* in ferrous Iron. Possible implication of these proteins in iron oxidation.

**FONDECYT-CONCURSO POSTDOCTORADO**

Investigador responsable

Duración: 3 años

Fecha de publicación: Ene\_2013