

## **Joanna Tannous, Ph.D.**

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### **RESEARCH INTERESTS**

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- Genetic engineering of non-model filamentous fungi to study their pathogenesis and uncover complex interaction with their hosts and other surrounding microbes.
- Discovery and characterization of novel fungal metabolites through genetic manipulation and “-omics” approaches to study their role in fungal-host interactions and microbiome dynamics.
- Development and implementation of novel genetic tools (i.e. gene drives) to control the virulence of plant pathogenic fungi and mitigate fungal infections.

### **EDUCATIONAL BACKGROUND**

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#### **Ph.D. in Pathology, Toxicology, Genetics and Nutrition (2011-2015)**

National Polytechnic Institute of Toulouse (INPT), Toulouse, France

#### **Ph.D. in Chemistry (2011-2015)**

Faculty of Science, St. Joseph University of Beirut, Lebanon

#### **M.S. in Food Chemistry (2008- 2010)**

Faculty of Science, St. Joseph University of Beirut, Lebanon

#### **B.S. in Life and Earth Sciences-Biochemistry (2005-2008)**

Faculty of Science, St. Joseph University of Beirut, Lebanon

### **HISTORY of EMPLOYMENT and INTERNSHIPS**

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#### **R&D Associate Staff Scientist (2022-Present)- Fungal Geneticist**

Oak Ridge National Laboratory, Biosciences Division, Oak Ridge, Tennessee, USA

#### **Postdoctoral Research Associate under the supervision of Dr. Carrie Eckert (2020-2022)**

Oak Ridge National Laboratory, Biosciences Division, Oak Ridge, Tennessee, USA

#### **Postdoctoral Researcher with Dr. Bruno Le Cam (2019 –2020)**

The Research Institute of Horticulture and Seeds (IRHS), UMR1345 INRA- University of Angers, France

#### **Postdoctoral Research Associate with Dr. Nancy Keller (2016 – 2018)**

Department of Medical Microbiology and Immunology, University of Wisconsin-Madison, Madison, USA

**Ph.D. student with Dr. Olivier Puel and Dr. Roger Lteif (2011–2015)**

The Immuno-mycotoxicology Team, Toxalim Research Center in Food Toxicology, INRA, Toulouse, France

Department of Chemistry, Faculty of Science, St. Joseph University of Beirut, Lebanon

**Research Assistant with Dr. Joseph Yaghi (2010 –2014)**

Microbiology Laboratory, Faculty of Science, St. Joseph University of Beirut, Lebanon

- Executed microbiological analysis for the detection, identification, and enumeration of microorganisms in water and various food products.

**Summer Research Project with Dr. Mireille Kallassy Awad (April –August 2011)**

Lebanese Human Tissue Bank, St. Joseph University of Beirut, Lebanon

**Master’s Research Project with Dr. Richard Maroun (January – June 2010)**

Laboratory of Characterization and Transformation of Agro-resources, Faculty of Science, St. Joseph University of Beirut, Lebanon

**Undergraduate Research Project with Dr. Mireille Kallassy Awad and Dr. André El Khoury (February – June 2009)**

Laboratory of Biodiversity and Functional Genomics, St. Joseph University of Beirut, Lebanon

**PUBLICATIONS**

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**Peer-Reviewed Journals:** 

1. Rush, T.A.; **Tannous, J.**; Lane, M.; Gopalakrishnan Meena, M.; Carrell, A.; Cottaz, S.; Ané, J.M.; Keller, N.P.; Jacobson, D.; Kainer, D.; Pelletier, D.; Abraham, P.; Giannone, R.J.; Labbé, J. (2022). Lipo-Chitooligosaccharides Induce Specialized Fungal Metabolite Profiles That Modulate Bacterial Growth. *mSystems*. [doi: 10.1128/msystems.01052-22](https://doi.org/10.1128/msystems.01052-22)
2. Melesse Vergara, M.; Labbé, J.; **Tannous, J.** (2022). Reflection on the challenges, accomplishments, and new frontiers of gene drives. *BioDesign Research*. [doi: org/10.34133/2022/9853416](https://doi.org/10.34133/2022/9853416).
3. **Tannous, J.**; Sawyer, C.; Hassan, M.M.; Labbé, J.; Eckert, C. Prospects of CRISPR-Cas9 RNP-Mediated Genome Editing of the Non-Model Plant Pathogen *Sphaerulina musiva*. *Under review in Frontiers in Genetics* as part of the special issue “Methods in Genomic Assay Technology”.
4. **Tannous, J.**; Cosetta, C.; Drott, M. T.; Rush, T. A.; Jiler, J; Abraham, P.; Giannone, R.J.; Keller; N. P., Wolfe, B. Fungal antibiotics control bacterial community diversity in the cheese rind microbiome. *Under review in mBio*. [doi:10.1101/2022.11.26.518062](https://doi.org/10.1101/2022.11.26.518062)
5. Gopalakrishnan, Meena M.; Lane; M., **Tannous, J.**; Carrell, A.A.; Ané, J.M.; Keller, N.P., Labbé, J.; Abraham, P.; Giannone, R.; Kainer, D.; Jacobson, D.; Rush, T.A. A light into the fungal metabolomic abyss: Network analysis for revealing relationships between exogenous compounds and their outputs. *Under review in PLOS Computational Biology*.

6. Pierce, E.C.; Morin, M.; Little, J.C.; Liu, R.B.; **Tannous, J.**; et al. (2020). Bacterial-fungal interactions revealed by genome-wide analysis of bacterial mutant fitness. *Nature Microbiology*. doi: [10.1038/s41564-020-00800-z](https://doi.org/10.1038/s41564-020-00800-z). – 21 citations
7. Rush, T.A.; Puech-Pages, V.; Bascaules, A.; Jargeat, P.; Maillet, F.; Haouy, A.; QuyManh Maës, A.; Carrera Carriel, C.; Khokhani, D.; Keller-Pearson, M.; **Tannous, J.**, et al. (2020). Lipochitooligosaccharides as regulatory signals of fungal growth and development. *Nature Communications* 11:3897. doi: [10.1038/s41467-020-17615-5](https://doi.org/10.1038/s41467-020-17615-5). – 23 citations
8. **Tannous, J.**; Barda, O.; Luciano, D.; Prusky, D.; Sionov, E.; Keller, N. (2020). New Insight into Pathogenicity and Secondary Metabolism of the Plant Pathogen *Penicillium expansum* Through Deletion of the Epigenetic Reader SntB. *Frontiers in Microbiology* 11:610. doi: [10.3389/fmicb.2020.00610](https://doi.org/10.3389/fmicb.2020.00610). – 19 citations
9. **Tannous, J.**; Kumar, D.; Sela, N.; Sionov, E.; Prusky, D.; Keller, N. (2018). Fungal attack and host defence pathways unveiled in near avirulent interactions of *Penicillium expansum creA* mutants on apples. *Molecular Plant Pathology* 19: 2526–2666. doi: [10.1111/mpp.12734](https://doi.org/10.1111/mpp.12734) – 31 citations
10. Yang, K.; Shadkchan, Y.; **Tannous, J.**; Figueroa, J. L.; Wiemann, P.; Osharov, N.; Wang, S.; Keller, N. (2018). Contribution of ATPase copper transporters in animal but not plant virulence of the crossover pathogen *Aspergillus flavus*. *Virulence* 9: 1273–1286. doi: [10.1080/21505594.2018.1496774](https://doi.org/10.1080/21505594.2018.1496774) – 18 citations
11. Kumar, D.; **Tannous, J.**; Keller, N.; Sionov, E.; Prusky, D. (2018). Apple intrinsic factors modulating the global regulator, laeA, the patulin gene cluster and patulin accumulation during fruit colonization by *Penicillium expansum*. *Frontiers in Plant Science* 9: 1–13. doi: [10.3389/fpls.2018.01094](https://doi.org/10.3389/fpls.2018.01094) – 15 citations
12. Khalid, S.; Baccile, J. A.; Spraker, J. E.; **Tannous, J.**; Imran, M.; Schroeder, F. C.; Keller, N. (2018). NRPS-Derived Isoquinolines and Lipopeptides Mediate Antagonism between Plant Pathogenic Fungi and Bacteria. *ACS Chemical Biology* 13: 171–179. doi: [10.1021/acschembio.7b00731](https://doi.org/10.1021/acschembio.7b00731) – 29 citations
13. **Tannous, J.**; Keller, N.; Atoui, A.; El Khoury, A.; Lteif, R.; Oswald, I. P.; Puel, O. (2017). Secondary Metabolism in *Penicillium expansum*: Emphasis on Recent Advances in Patulin Research. *Critical Reviews in Food Science and Nutrition* 58: 2082–2098. doi: [10.1080/10408398.2017.1305945](https://doi.org/10.1080/10408398.2017.1305945) – 51 citations
14. **Tannous, J.**; Snini, S. P.; El Khoury, R.; Canlet, C.; Pinton, P.; Lippi, Y.; Alassane-Kpembé, I.; Gauthier, T.; El Khoury, A.; Atoui, A.; Zhou, T.; Lteif, R.; Oswald, I. P.; Puel, O. (2017). Patulin-transformation products and last intermediates in its biosynthetic pathway, E and Z-ascladiol, are not toxic for human cells. *Archives of Toxicology* 91: 2455–2467. doi: [10.1007/s00204-016-1900-y](https://doi.org/10.1007/s00204-016-1900-y) – 52 citations
15. Kumar, D.; Barad, S.; Chen, Y.; Luo, X.; **Tannous, J.**; Dubey, A.; Glam, N.; Tian, S.; Li, B.; Keller, N.; Prusky, D. (2016). LaeA regulation of secondary metabolism modulates virulence in *Penicillium expansum* and is mediated by sucrose: LaeA modulates patulin accumulation. *Molecular Plant Pathology* 8: 1150–1163. doi: [10.1111/mpp.12469](https://doi.org/10.1111/mpp.12469) – 54 citations
16. **Tannous, J.**; Francis, Z.; Atoui, A.; El Khoury, A.; Puel, O.; Oswald, I. P.; Lteif, R. (2016). A study on the physicochemical parameters for *Penicillium expansum* growth and patulin

- production: Effect of temperature, pH and water activity. *Food Science & Nutrition* 4: 611–622. doi: [10.1002/fsn3.324](https://doi.org/10.1002/fsn3.324) – 57 citations
17. Snini, S. P.; **Tannous J.**; Heuillard, P.; Bailly, S.; Lippi, Y.; Zehraoui, E.; Barreau, C.; Oswald, I. P.; Puel; O. (2015). Patulin is a cultivar dependent aggressiveness factor favoring the colonization of apples by *Penicillium expansum*. *Molecular Plant Pathology* 17: 920–930. doi: [10.1111/mpp.12338](https://doi.org/10.1111/mpp.12338) – 74 citations
  18. **Tannous, J.**; Atoui, A.; El Khoury, A.; Kantar, S.; Chdid, N.; Oswald, I. P.; Puel, O.; Lteif, R. (2015). Development of a Real-Time PCR assay for *Penicillium expansum* quantification and patulin estimation in apples. *Food Microbiology* 50: 28–37. doi: [10.1016/j.fm.2015.03.001](https://doi.org/10.1016/j.fm.2015.03.001) – 32 citations
  19. **Tannous, J.**; El Khoury, R.; Snini, S. P.; Lippi, Y.; El Khoury, A.; Atoui, A.; Lteif, R.; Oswald, I. P.; Puel; O. (2014). Sequencing, physical organization and kinetic expression of the patulin biosynthetic gene cluster from *Penicillium expansum*. *International Journal of Food Microbiology* 189: 51–60. doi: [10.1016/j.ijfoodmicro.2014.07.028](https://doi.org/10.1016/j.ijfoodmicro.2014.07.028) – 74 citations
  20. Nada El Darra, **Tannous, J.**; Bou Mouncef, P.; Palge, J.; Yaghi, J.; Vorobiev, E.; Louka, N.; Maroun, R. G. (2012). A Comparative Study on Antiradical and Antimicrobial Properties of Red Grapes Extracts Obtained from Different *Vitis vinifera* Varieties. *Food and Nutrition Sciences* 3: 1420–1432. doi: [10.4236/fns.2012.310186](https://doi.org/10.4236/fns.2012.310186) – 46 citations

### Book Chapters

1. **Tannous, J.**; Labbé, J; Keller, N.P. Identifying fungal secondary metabolites and their role in plant pathogenesis. *In press* in *Methods in Molecular Biology* as part of an edition on Plant-Pathogen Interactions.
2. **Tannous, J.**; Keller, N. Mycotoxins. Chapter 129, Manual of Clinical Microbiology, 12<sup>th</sup> Edition. *American Society of Microbiology*: 2278-2290. doi: [10.1128/9781555819842](https://doi.org/10.1128/9781555819842)

### MENTORING EXPERIENCE

(\*co-author on publication, † poster or oral presentations)

| Mentoring period | Student                            | Degree/ Major or program                  | University                              |
|------------------|------------------------------------|---|---|
| 2020-Present     | Cole Sawyer <sup>†</sup>           | Ph.D. Genome Science and Technology       | University of Tennessee, Knoxville, USA |
| 2019             | Mathilde Billaud <sup>†</sup>      | B.S. Systematic Plant Biology             | University of Angers, Angers, France    |
| 2018             | Nicholas Raffa                     | Ph.D. Medical Microbiology and Immunology | UW Madison, Madison, USA                |
| 2018             | Dandan Shao <sup>†</sup>           | Ph.D. Plant Pathology                     | UW Madison, Madison, USA                |
| 2018             | Shelby Petersen                    | M.S. Molecular & Environmental Toxicology | UW Madison, Madison, USA                |
| 2018             | Shannon Piper <sup>†</sup>         | Ph.D. Plant Pathology                     | UW Madison, Madison, USA                |
| 2018             | Dianiris L. Rosario <sup>*,†</sup> | Ph.D. Plant Pathology                     | UW Madison, Madison, USA                |
| 2018             | Chibueze D.                        | M.S. Bacteriology                         | UW Madison, Madison, USA                |

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|-----------|-----------------------------|------------------------------|--|
|           | Nwagwu                      |                              |  |
| 2016-2017 | Emma Allen <sup>†</sup>     | B.S. Biology                 | UW Madison, Madison, USA               |
| 2015      | Nathalie Nahas <sup>†</sup> | M.S. Agriculture engineering | St. Joseph University, Beirut, Lebanon |
| 2015      | Rosaire Raad <sup>†</sup>   | M.S. Food Chemistry          | St. Joseph University, Beirut, Lebanon |
| 2014-2015 | Nader Chedid <sup>*</sup>   | M.S. Food Chemistry          | St. Joseph University, Beirut, Lebanon |
| 2014-2015 | Sally Kantar <sup>*</sup>   | M.S. Food Chemistry          | St. Joseph University, Beirut, Lebanon |
| 2013      | Joanna Dahdah <sup>†</sup>  | M.S. Food Chemistry          | St. Joseph University, Beirut, Lebanon |
| 2012      | Milly Tannous <sup>†</sup>  | M.S. Food Chemistry          | St. Joseph University, Beirut, Lebanon |

## TEACHING EXPERIENCE

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### St. Joseph University of Beirut (2016)

*Instructor:* Prepared the content and taught the lab section of Industrial Microbiology for student in the Food Chemistry Master's study program.

### St. Joseph University of Beirut- Faculty of Science (2010-2015)

*Teaching Assistant:* Assisted in preparation, execution and grading of weekly lab reports for the following laboratory sections:

(\*class preparation, <sup>†</sup> teaching and grading)

| Year(s)   | Laboratory class               | Major and Course Level   |
|-----------|--------------------------------|--|
| 2011      | Plant Biology <sup>*</sup>     | B.S. Life and Earth Sciences-Biochemistry (1 <sup>st</sup> year) |
| 2011-2015 | Microbiology <sup>*</sup>      | B.S. Life and Earth Sciences-Biochemistry (3 <sup>rd</sup> year) |
| 2011-2015 | Plant Physiology <sup>*</sup>  | B.S. Life and Earth Sciences-Biochemistry (3 <sup>rd</sup> year) |
| 2012      | General Biology <sup>*</sup>   | B.S. Life and Earth Sciences-Biochemistry (1 <sup>st</sup> year) |
| 2012-2013 | Parasitology <sup>*,†</sup>    | B.S. Life and Earth Sciences-Biochemistry (3 <sup>rd</sup> year) |
| 2012-2014 | Animal Biology <sup>*,†</sup>  | B.S. Life and Earth Sciences-Biochemistry (2 <sup>nd</sup> year) |
| 2012-2014 | Animal Anatomy <sup>*,†</sup>  | B.S. Life and Earth Sciences-Biochemistry (3 <sup>rd</sup> year) |
| 2013-2014 | Genetics <sup>*</sup>          | B.S. Life and Earth Sciences-Biochemistry (2 <sup>nd</sup> year) |
| 2013-2015 | Food Microbiology <sup>*</sup> | M.S. Food Chemistry (1 <sup>st</sup> year)                       |
| 2014-2015 | Immunology <sup>*</sup>        | B.S. Life and Earth Sciences-Biochemistry (3 <sup>rd</sup> year) |
| 2015      | Molecular Biology <sup>*</sup> | B.S. Life and Earth Sciences-Biochemistry (3 <sup>rd</sup> year) |

## ORAL COMMUNICATIONS and POSTER PRESENTATIONS

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### Conference Proceedings

- Tannous, J.;** Sawyer, C.; Kainer D.; Carrell, A.; Clark, M.; Labbe, J.; Muchero, W.; A. Cregger, A. M.; Eckert, C.; Abraham, P. (2022). Development of CRISPR-Cas editing tools in *Sphaerulina musiva* towards controlling its establishment and pathogenicity in the model ecosystem, *Populus*. *31st Fungal Genetics Conference*. Pacific Grove, California, USA (Virtual poster presentation).
- Tannous, J.;** Sawyer, C.; Kainer D.; Carrell, A.; Clark, M.; Labbe, J.; Muchero, W.; A. Cregger, A. M.; Eckert, C.; Abraham, P. (2022). Development of CRISPR-Cas editing tools in

- Sphaerulina musiva* towards controlling its establishment and pathogenicity in *Populus* ecosystems. 2022 Genomic Sciences Program (GSP) Annual PI Meeting, Washington, D.C., USA (Virtual poster presentation).
3. **Tannous, J.**; Sawyer, C.; Carrell, A.; Clark, M.; Labbe, J.; Abraham, P. (2021). Understanding the establishment of *Sphaerulina musiva* and development of genetic approaches to enhance poplar disease control. 2021 Genomic Sciences Program (GSP) Annual PI Meeting, Washington, D.C., USA (Virtual poster presentation).
  4. Rush, T.A.; Prates, E.T.; Demerdash, O.N.; Ellis, C.; Shah, M.; **Tannous, J.**; Jacobson, D.; Labbé J.; Doktycz M. (2021). Plant-Microbe Interfaces: Characterizing the perception of lipochitooligosaccharides signaling in fungi. 2021 Genomic Sciences Program (GSP) Annual PI Meeting, Washington, D.C., USA (Virtual poster presentation).
  5. Rush, T.A.; Meena, M.G.; **Tannous, J.**; Abraham P., Giannone R., Labbé J. (2020). Lipochitooligosaccharides (LCOs) are biotic stress factors in *Aspergillus fumigatus*. The 14<sup>th</sup> Annual Vanderbilt Postdoctoral Associations Symposium, Nashville, Tennessee, USA (Virtual poster presentation).
  6. **Tannous, J.**; Cosetta, C.; Jiler, J.; Keller, N. P.; Wolfe, B. (2019). The secondary metabolism regulator LaeA in *Penicillium sp.* influences the cheese rind community assembly. 30<sup>th</sup> Fungal Genetics Conference, Pacific Grove, California, USA (Oral communication).
  7. **Tannous, J.**; Kumar, D.; Sela, N.; Sionov, E.; Prusky, D.; Keller, N. P. (2018). Fungal attack and host defense pathways unveiled in near avirulent interactions of *Penicillium expansum creA* mutants on apples. Gordon Research Conference on Cellular and Molecular Fungal Biology, New Hampshire, USA (Poster presentation).
  8. **Tannous, J.**; Won, T. H.; Hoan Le, H.; Pfannenstiel, B.; Baccile, J. A.; Schroeder, F. C.; Keller, N. (2018). Activation and Characterization of a silent secondary metabolite biosynthetic gene cluster in *Aspergillus flavus*. Keystone Symposia on Molecular and Cellular Biology, California, USA (Poster presentation).
  9. **Tannous, J.**; Luo, X.; Kumar, D.; Barad, S.; Chen, Y.; Dubey, A.; Matana, N. G.; Tian, S.; Li, B.; Prusky, D.; Keller, N. (2017). Crosstalk of LaeA and CreA in controlling virulence and secondary metabolism in *Penicillium expansum*. 29<sup>th</sup> Fungal Genetics Conference, Pacific Grove, California, USA (Poster presentation).
  10. **Tannous, J.**; Luo, X.; Kumar, D.; Barad, S.; Chen, Y.; Dubey, A.; Matana, N. G.; Fainberg, O.; Kapulnov; T.; Li, B.; Prusky, D.; Keller, N. (2016). LaeA-dependent regulation of secondary metabolite gene clusters in *Penicillium expansum* including the patulin cluster. Food Research Institute (FRI) 2016 Spring Meeting. Madison, Wisconsin, USA (Poster presentation).
  11. **Tannous, J.**; Snini, S. P.; El Khoury, R.; Lippi, Y.; El Khoury, A.; Atoui, A.; Lteif, R.; Oswald, I. P.; Puel, O. (2015). The disruption of *patL*, the patulin specific transcription factor affects *Penicillium expansum* virulence on apple. 21<sup>th</sup> Annual LAAS Conference. Beirut, Lebanon (Oral communication).
  12. **Tannous, J.**; Snini, S. P.; El Khoury, R.; Lippi, Y.; El Khoury, A.; Atoui, A.; Lteif, R.; Oswald, I. P.; Puel, O. (2014). Patulin is significantly involved in the development of blue mold decay on apples. 14<sup>th</sup> Congress Mediterranean Phytopathological Union & International Society of Mycotoxicology. Istanbul, Turkey (Oral communication).

13. **Tannous, J.**; Snini, S. P.; El Khoury, R.; Lippi, Y.; El Khoury, A.; Atoui, A.; Lteif, R.; Oswald, I. P.; Puel, O. (2014). Sequencing, physical organization and kinetic expression of the patulin biosynthetic gene cluster from *Penicillium expansum*. *36th Mycotoxin Workshop*. Göttingen, Germany (Poster presentation).
14. Snini, S. P.; **Tannous, J.**; Bailly, S.; Zehraoui, E.; Barreau, C.; Puel, O.; Oswald, I. P. (2014). PATL, a Cys6 zinc finger transcription factor is involved in the regulation of the patulin biosynthesis in *Penicillium expansum*. *36th Mycotoxin Workshop*. Göttingen, Germany (Oral communication).
15. **Tannous, J.**; Snini, S. P.; El Khoury, R.; Lippi, Y.; El Khoury, A.; Atoui, A.; Lteif, R.; Oswald, I. P.; Puel, O. (2014). Caractérisation du cluster de gènes impliqués dans la biosynthèse de la patuline chez *Penicillium expansum*. *5ème journée Mycotoxines*. Montpellier, France (Oral communication).
16. **Tannous, J.**; El Khoury, A.; Atoui, A.; Puel, O.; Oswald, I. P.; Lteif, R. (2014). Development of a Real-Time PCR assay for *Penicillium expansum* quantification and patulin estimation in apple samples. *20th Annual LAAS Conference*. Hadath, Lebanon (Oral communication).

### Seminars

1. **Tannous, J.** (2020). Genetic engineering of fungal plant pathogens to mitigate plant diseases: Past experiences and Future directions. Synthetic Biology-Microbial Group, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA (Virtual oral communication)
2. **Tannous, J.** (2017). Fungal attack and host defense pathways unveiled in near avirulent interactions of *Penicillium expansum creA* mutants on apples. Plant Pathology Department, University of Wisconsin- Madison, Wisconsin, USA (Oral communication).

### Symposia

1. **Tannous, J.**; Kumar, D.; Barad, S.; Dubey, A.; Sionov, E.; Prusky, D.; Keller, N. (2018). The *Penicillium expansum* carbon catabolite repressor CreA is essential for fungal development, pathogenesis and patulin biosynthesis. Food Research Institute 2018 Spring Meeting. Madison, Wisconsin, USA (Poster presentation)
2. **Tannous, J.**; Liu, X.; Kumar, D.; Barad, S.; Chen, Y.; Dubey, A.; Kapulnov, T.; Li, B.; Prusky, D.; Keller, N. (2016). LaeA- dependent regulation of secondary metabolite gene clusters in *Penicillium expansum* including the patulin cluster. Food Research Institute 2016 Spring Meeting. Madison, Wisconsin, USA (Poster presentation).

### FELLOWSHIPS and AWARDS

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1. Keystone Symposia Travel Award 2018: \$1,200.
2. Genetic Society of America Travel Award 2019: \$250.
3. Fellowship from the French embassy in Lebanon to pursue doctoral studies in France: \$18,000.
4. Doctoral Grant from the National Council for Scientific Research (CNRS) – Lebanon (grant number: 3443): \$15,000.

5. Doctoral Grant from the Research Council of St. Joseph University of Beirut- Lebanon (grant number: FS38): \$12,000.

## COMMUNITY SERVICES

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### Editorial roles (2020- Present)

- **Topic Editor:** Special edition research topic “Insights in Fungal Secondary Metabolites and Mycotoxins: 2022” in *Frontiers in Fungal Biology*.  
<https://www.frontiersin.org/research-topics/36151/insights-in-fungal-secondary-metabolites-and-mycotoxins-2022>

### Peer-review services (2014- Present)

- **Journal reviewer:**  

|   |                |
|---|----------------|
| Agronomy  | Molecules      |
| Antibiotics   | Microorganisms |
| Biosensors  | Plants         |
| Comprehensive Reviews in Food Science and Food Safety | Toxins         |
| Frontiers in Microbiology                             |                |
| International Journal of Molecular Sciences           |                |
| Fungal Genetics and Biology                           |                |

## OUTREACH SERVICES

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### “Open Doors Day” at St. Joseph University (2011-2014)

I participated in organizing this recruitment event hosted by the Faculty of Sciences at St. Joseph University, which occurred every year to introduce high school students to the different programs and research projects conducted by our faculty.

### Annual Science Exposition at the Museum of Toulouse, France (2013)

Along with other members of the Immuno-Mycotoxicology team at INRA-Toulouse, I organized and executed the science exposition to present the work we conduct in the lab and familiarize the public with the fungal world.

### French Institute for Cider Production (IFPC) (2013-2015)

As part of my doctoral work, I organized a one- day extension event to discuss with apple growers at the IFPC the importance of the fundamental molecular research we were conducting in the lab and how this can have valuable application to reduce yield losses in the apple industry. This led to a productive collaboration and a publication.

## PROFESSIONAL ORGANIZATION MEMBERSHIPS

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**2017- Present:** Genetics Society of America (GSA)

**2016:** American Society for Microbiology (ASM)



## **TRAINING COURSES and CERTIFICATES**

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**2022:** CRISPR: Revolutionizing Genome Editing Certificate Program

By CRISPR Biotech Engineering (CBE), Caerphilly, Wales, UK.

This course gave a comprehensive knowledge of CRISPR technology and the latest advancements.

**2012:** Supervising Food Safety Training- Level 3

Certified by HABC (Highfield Awarding Body for Compliance), UK

GWR, Sin El Fil, Lebanon

This course covered different modules on microbiology and food safety management.