

Ali MAHJOUR, PhD

د. علي المحجوب

Molecular Biology, Biochemistry & Plant Biotechnology

Born on February 12, 1977,

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Research Interests

My research combines different biotechnological tools aiming to improve the plant viability and productivity in arid regions.

I first worked on date palm biotechnology and pest management under the supervision of Professor Nouredine DRIRA at the National School of Engineers of Sfax (Tunisia).

During my PhD work supervised by both Professor Mohamed MARS in Tunisia and Professor Said HAMDJ in France, I generated a "grape tomato" transgenic plant from "cherry tomato" by biotechnological tools and studied the involvement of MYB transcription factors in elaborating the organoleptic quality of grape berries as well as the structure-function relationship of MYB transcription factors. The PhD work was done in tight collaboration between the Institute of Plant Molecular Biology (IBPM) of Bordeaux (Pr. Michel HERNOULD's team) & the Institute of Wine and Grapevine Sciences (ISVV) of Bordeaux (Pr. Serge DELROT's team) - France.

Currently, at the Center of Desert Agriculture (CDA) belonging to the King Abdullah University of Science and Technology (KAUST) in Saudi Arabia, I am working on plant biotechnology under the supervision of Professor Nina V. Fedoroff. The aim is to understand and modulate the mechanisms of plant responses to adverse environmental conditions such as high soil salinity and drought stress, as well as to improve the plant yielding by biotechnological tools.

Education Profile

2009 PhD, Biological Sciences: Molecular Biology, Biochemistry & Plant Biotechnology, University of Bordeaux II (France) & University of Sfax (Tunisia). (Franco-Tunisian co-directed PhD Thesis).

2004 Master Science in Biology Engineering, (French system, 2 years). National School of Engineers of Sfax (ENIS) – Tunisia.

2001 B.S., (French system, 4 years), **Life Sciences**, Faculty of Sciences of Gabès (Tunisia).

Other Diploma (Human Sciences)

2007 Master Degree ès Human Sciences: Languages and Civilizations in arabe and islamic world, Université Michel De Montaigne Bordeaux 3 (FRANCE).

Professional Profile

- **Postdoctoral fellowship, Center for Desert Agriculture, King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia. Since September 2012.**
- **Consultant Researcher, King Abdullah University of Science and Technology (KAUST), Division of Chemical Life Sciences, DARI: Desert Agriculture Research Initiative, CDA: Center for Desert Agriculture, King Abdullah University of Science and Technology, Kingdom of Saudi Arabia. March 2012 - September 2012.**
- **Teaching Assistant, University of Gabes, Department of Biology, Tunisia. 2004-2007.**

Awards and Recognitions

- **September 2012- Present: Postdoctoral Fellowship, Center for Desert Agriculture (CDA), King Abdullah University of Science and Technology (KAUST). Fedoroff Research Group.**
- **2005-2007: PhD Fellowship, French Foreign Affairs Ministry.**
- **2004: PhD Fellowship, Tunisian Ministry of Higher education & Scientific research,**

SKILLS

Molecular biology and Biochemistry: Extraction, purification and analysis of DNA and RNA; PCR; RT-PCR; Transcriptome analysis (DNA microarray); Cloning, over-expression and purification of recombinant proteins; protein analysis by SDS-PAGE, Western blot; affinity chromatography, size exclusion chromatography; metabolism analysis, HPLC, Molecular scissors (TALENs and CRISPR) for precision genetic engineering in Crop improvement.

Horticulture & Plant biotechnology: *In vitro* cell and tissue culture (Date palm, Grapevine, Tobacco, Tomato, Potato, Arabidopsis); establishment and analysis of Date palm embryogenic cell suspension cultures; plant transgenesis (Tobacco, Tomato, Arabidopsis); Plant metabolism profiling (phenol compounds, terpenoids...); histology; Electronic scanning microscopy, Flow cytometry.

Computer skills: Word, Excel, PowerPoint, Photoshop, Internet, bioinformatics tools...

Publications and Manuscript in Preparation

1. Mustapha Aouida, Marek Piatek, **Ali Mahjoub**, Jun Pan, Ren Jian, Ali Shahjahan, Nina Fedoroff and Magdy Mahfouz. Mapping and characterization of DNase I hypersensitive sites in yeast chromatin expressing TALE Nucleases. (**in preparation**).
2. Li, Lixin; Atef, Ahmed; Piatek, Agnieszka; Ali, Zahir; Piatek, Marek; Aouida, Mustapha; Sharakou, Altan; **Mahjoub, Ali**; Wang, Guangchao; Khan, Suhail; Fedoroff, Nina; Mahfouz, Magdy. Characterization and DNA Binding Specificities of Ralstonia TAL-like Effectors. **Mol Plant. 2013 Jan 8.**
3. Imène Hichri, Laurent Deluc, Francois Barrieu, Jochen Bogs, **Ali Mahjoub**, Farid Regad, Bernard Gallois, Thierry Granier, Claudine Trossat-Magnin, Eric Gomès and Virginie Lauvergeat (**2011**) A single amino acid change within the R2 domain of the *VvMYB5b* transcription factor modulates affinity for protein partners and target promoters selectivity". **BMC Plant Biology, 11:117.**
4. L. Fki, R. Masmoudi, W. Kriaâ, **A. Mahjoub**, B. Sghaier, R. Mzid, A. Mliki, A. Rival, and N. Drira (2011) Date Palm Micro-propagation via Somatic Embryogenesis. *In Date Palm Biotechnology*, S.M. Jain et al. (eds.), Springer Science+Business Media B.V. 2011, pp: **47-68.**
5. **Ali Mahjoub**, Michel Hernould, Jérôme Joubès, Alain Decendit, Mohamed Mars, Saïd Hamdi and Serge Delrot (**2009**) Overexpression of a grapevine R2R3-MYB factor in tomato affects vegetative development, flower morphology and flavonoid and terpenoid metabolism. **Plant Physiology and Biochemistry 47, 551-561.**
6. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi (**2007**) "phenolic compounds and the quality of grape berry: Functional study of an R2R3-MYB transcription factor". *In Act of the International Symposium of Oenology. University of Bordeaux2-France.*

7. Amira Bidani, Oumema Nouri-Ellouz, Lilia Lakhoua, Darasinh Sihachakr, Catherine Cheniclet, **Ali Mahjoub**, Nouredine Drira, Radhia Gargouri-Bouzid (2007) Interspecific potato somatic hybrids between *Solanum berthaultii* and *Solanum tuberosum* L. showed recombining plastome and improved tolerance to salinity. **Cell Tiss Organ Cult** 91, 179-189.
8. Besma Saadaoui, Jalila Bekir, Josiane Akrou, Salah Ammar, **Ali Mahjoub** and Mohamed Mars (2006) "Study of the composition and the antioxydant capacity of the phenolic compounds of some plant species of Tunisian arid regions" in Acts of the international seminar "Plants with Perfume, Aromatiques and Medicinal" **Review of the Arid Areas, NS: pp. 87-92.**
9. Lotfi Fki, Raja Masmoudi, **Ali Mahjoub**, Rim Mzid & Nouredine Drira (2004) "Biotechnology for date palm propagation and improvement" **In: Proceeding of the 5th Tunisia-Japan Symposium on Culture, Science and Technology, pp. 195-201.**
10. **Ali Mahjoub**, Lotfi Fki, Rim Mzid and Drira Nouredine (2004) " Gamma rays irradiation on date palm *in vitro*-cultures and pre-selection for Bayoud resistance: Biochemical investigation " **Review of the Arid Areas, NS: 704- 710.**

NATIONAL SCIENTIFIC CONGRESS AND SYMPOSIA

1. Besma Sghaier, **Ali Mahjoub**, Lotfi Fki, Mouna Bahloul, Hafedh Mejdoub and Nouredine Drira "Maturation of the Date palm somatic embryos: study of the involved proteins" 15th scientific workshop of the Tunisian Association of Biological Sciences ATSB, Mars 19-22, 2004.
2. **Ali Mahjoub**, Lotfi Fki and Nouredine Drira "Use of the *in vitro* culture and the gamma rays irradiation in the programme of Date palm improvement for resistance to Bayoud disease" Third scientific workshop of the Tunisian Association of Biotechnology, December 20-23, 2003.
3. **Ali Mahjoub**, Lotfi Fki and Nouredine Drira "*In vitro* Gamma rays mutagenesis induced on Date palm and perspective to select mutants of resistance to Bayoud disease"; First Maghreb days of Biotechnology and Second scientific workshop of the Tunisian Association of Biotechnology, December 15-18, 2002.
4. **Ali Mahjoub** Participation in the regional Symposium on Plant Biotechnology of the Tunisian Association of Biological Sciences (ATSB), Hammamet –Tunisia, September 13-15, 2002.

INTERNATIONAL SCIENTIFIC CONGRESS AND SYMPOSIA

1. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "Evidences of the involvement of MYB transcription factors in the regulation of terpenoid metabolism: Potential economic impact" International Symposium of Biotechnology, Sfax, May 4th-8th 2008.
2. **Ali Mahjoub**, Laurent Deluc, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi " How MYB domains preserve a so high similar folding? New insights into the structural conservation features "3rd international conference of the Magreban Society of Biotechnology. **March 20-24, 2008, Hammamet-Tunisia.**
3. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "A grapevine R2R3-Myb cluster with a new biological role: Further insights into the regulatory mechanisms of terpenoid metabolism"; COST Action 858 Workshops " Vineyard under environmental constraints: Adaptations to climate changes" Abiotic Stress Ecophysiology and Grape Functional Genomics, **Lodz, Poland, October 18-20, 2007.**
4. **Ali Mahjoub**, Laurent Deluc, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "Structure-function relationship of a grapevine R2R3-MYB transcription Factor" 7th conference of the Société Française de Biologie Végétale (SFBV). **September 12-14, 2007, Versaille-France.**
5. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "Overexpression of a grapevine R2R3-MYB transcription Factor alters epicuticular wax in transgenic tomato plants" 7th conference of the Société Française de Biologie Végétale (SFBV). **September 12-14, 2007, Versailles-France.**
6. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "The phenolic compounds and the quality of grape berry: Functional study of an R2R3-MYB transcription factor". 8th International Symposium of Oenology "OENO 2007" in **Bordeaux-France, June 2007.**
7. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "Pleiotropic effect of the over expression of a R2R3-MYB transcription Factor from grapevine *Vitis vinifera* L. in tomato: functional analysis". Workshop "Understanding the genetic and molecular basis of quality and production traits in

grapevine: From traits to genes and backwards "In **Logroño, Rioja, Spain, May 6-8, 2007** organized by the European Co-operation in the field of Scientific and Technical Research, Action 885 (Grapevine).

8. Besma Saadaoui, Jalila Bekir, Josiane Akrou, Salah Ammar, **Ali Mahjoub** and Mohamed Mars (2006) "Study of the composition and the antioxydant capacity of the phenolic compounds from some plant species of Tunisian sub-Saharan regions" international Seminar "Plants with Perfume, Aromatiques and Medicinal Compounds" **Medenine-Tunisia, 2007.**

9. **Ali Mahjoub**, Michel Hernould, François Barrieu, Mohamed Mars, Serge Delrot and Saïd Hamdi "Functional analysis of tow R2R3-Myb transcription factors of grapevine *Vitis vinifera*" 15th International Congress of the "Federation of European Societies of Plant Biology FESPB" in **Lyon-France, July 17-21, 2006.**

10. **Ali Mahjoub**, Lotfi Fki, Rim Mzid and Nouredine Drira" Gamma rays irradiation on date palm vitro-cultures and pre-selection for Bayoud resistance: Biochemical investigation ". International meeting "Aridoculture and Sub-Saharan cultures: ways for a sustainable development in arid regions ". **Jerba (Tunisia) November 22 - 25, 2004.**

11. Lotfi Fki, Raja Masmoudi, **Ali Mahjoub**, Rim Mzid and Nouredine Drira "Biotechnology for date palm propagation and improvement". 5th Tunisia-Japan Symposium on Culture, Science and Technology, **Sfax, 2004.**

12. **Ali Mahjoub** and Nouredine Drira "Control program of date palm Bayoud disease: preliminary record of Gamma ray irradiation of date palm *in vitro* cultures in order to select Bayoud resistance mutants "Regional Workshop FAO/IAE "Hardening and commercialization of *in vitro* seedlings, disease indexing, and greenhouse technology in date palm" 1st - 5 **December 2003 (RAF /5/035), Sfax & Tozeur (TUNISIA).**

PRACTICAL EXPERIENCE

4 years of PhD training in France; Institute of Plant Molecular Biology (IBVM) of Bordeaux.

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| 1st/05 - 31/12 /2004 | 8 months of PhD Training, Institute of Plant Molecular Biology (I. B.V.M) - Bordeaux, France. Supervised by Professor Saïd HAMDI. |
| 1st /05 - 31/01 /2006 | 9 months of PhD Training, Institute of Plant Molecular Biology (I. B.V.M) - Bordeaux, France. Supervised by Professor Saïd HAMDI. |
| 1st/12/2005-31/01/2006 | 2 months of PhD Training, <i>Purification of MYB recombinant proteins by Size exclusion chromatography</i> , European Institute of Chemistry and Biology (IECB), Bordeaux, France. Supervised by Dr. Bernard Gallois. |
| 1st /05-30/09 /2006 | 5 months of PhD Training, Institute of Plant Molecular Biology (I. B.V.M) - Bordeaux, France. Supervised by Professor Saïd HAMDI. |
| 1st/06/2006-30/11/2006 | 2 months of PhD Training, <i>Purification of MYB recombinant proteins by size exclusion chromatography</i> , European Institute of Chemistry and Biology (IECB), Bordeaux, France. Supervised by Dr. Bernard Gallois. |
| 1st/02-31/12/2007 | 11 months of PhD Training, Institute of Sciences of the Vine and Wine (ISVV) of Bordeaux, France. Supervised by Professor Serge DELROT. |

TEACHING EXPERIENCE

5 years teaching experience at the Tunisian university.

- 1. Biochemistry & Molecular Biology** for the 1st year B.S. of Biology, Faculty of Sciences, University of Gabès, (TUNISIA), **2007-2008.**
- 2. Biochemistry & Molecular technologies** for the 1st and 3rd year B.S. of Biology, Faculty of Sciences University of Gabès, (TUNISIA), **2006-2007.**
- 3. Biochemistry** for the 2nd year B.S. of Biology, Faculty of Sciences University of Gabès, (TUNISIA), **2005 – 2006.**
- 4. Biochemistry** for the 2nd year B.S. of Biology, Faculty of Sciences University of Gabès, (TUNISIA), **2004 – 2005.**
- 5. Plant Physiology** for the 2nd year B.S. of Biology, Faculty of Sciences University of Sfax, (TUNISIA), **2003 – 2004.**

PEDAGOGIC TRAINING

2002 & 2003: 1st & 2nd Pedagogy training course: "*information technology and teaching methods*", National School of Engineers of Sfax (Tunisia).

REFERENCES

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