



# forum

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## Ischemia-Reperfusion Injury and Graft Storage Solutions

Jerry E. Cooley, MD *Charlotte, North Carolina*

### Introduction

In the course of follicular unit transplantation, thousands of hair follicles are removed from one place and transplanted to another. We are all aware of the issue of growth and how important it is in achieving density and patient satisfaction. Most of us accept that the most important factor in obtaining optimal growth is avoiding **physical trauma** by transplanting physically intact hair follicles that have not been transected, dehydrated, or crushed. After this, we realize how important **vascular perfusion** in the recipient bed is to the survival of our grafts. Primary factors in reducing vascular perfusion are scarring from prior surgery and overzealous operative injury to the recipient bed with incisions that are too big or too dense. Beyond this, we recognize **infection**, **idiopathic factors** ("X factor"), and, perhaps, "something the patient did" in affecting the growth of our grafts.

However, another key consideration is what I call **biochemical factors**, something to which we as hair transplant surgeons have paid little attention. When surgeons transplant whole organs (e.g., livers and kidneys), they consider these factors as important as immunologic rejection in determining the viability of the transplant. Of course, careful immunologic matching

and immunosuppressive medications help avoid rejection. A tremendous amount of research has been done to identify and overcome biochemical injury to transplanted tissue and organs, research that has direct implications for hair transplantation. These biochemical factors can be divided into **ischemia-reperfusion injury (IRI)** and **storage injury**.

IRI has been a research interest of mine for the past couple of years. Put simply, IRI is the biochemical injury to the transplants that occurs after they have undergone a period of low oxygen (ischemia) and then implanted in the recipient sites where they are exposed to oxygen (reperfusion). It's an automatic reaction that is only partially understood. What is known is that IRI results from the formation of "free radicals," sometimes called reactive oxygen species (ROS). This occurs in both the transplanted cells as well as the neutrophils present in the recipient tissue. These free radicals can be thought of as "molecular terrorists" that bounce around, injuring the inside and outside of the cell. Damaged cells within the hair follicle may result in suboptimal growth.

Does IRI injury occur in transplanted hair follicles? To answer this, I used a standard method of checking for free

*continued on page 127*

### Regular Features

President's Message .....	122
Co-Editors' Messages .....	123
Notes from the Editor Emeritus .....	124
Book Review .....	128
Pioneer of the Month .....	129
Scalp Pathology .....	133
Cyberspace Chat .....	136
Hair Repair Case #6 .....	145
Once Upon a Time .....	147
Letter to the Editor .....	149
Surgical Assistants Corner .....	151

### Feature Articles

Case Report: Arteriovenous Fistula .....	125
Improving Survival of Follicular Unit Grafts .....	126
Two New Instruments for Automation .....	131
Update in Hair Follicle Research: Implications for Gene and Cell Therapy .....	139
Meeting Review: American Academy of Cosmetic Surgery .....	140
Response to Hair Repair Case #3 .....	143
Office Techniques of Drs. Hasson and Wong .....	151

### The BIG One, Down Under



**ISHRS 13<sup>th</sup> Annual Meeting**  
**Sydney, Australia**  
**August 24-28, 2005**

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The ISHRS Golden Follicle Award sculpture, as seen on the cover of this issue, was designed by Francisco Abril, MD. Dr. Abril offers for sale, copies of a small bronze hair follicle sculpture (10" high). For more information, please contact: Clinica Dr. Francisco Abril, PO dela Habana, 137, 28036 Madrid, Spain. Phone: 34-1-359-1961; Fax: 34-1-359-4731.



# President's Message



Mario Marzola, MBBS  
Adelaide, Australia

Farewell dear colleagues. This is my last message to the readers of the *Hair Transplant Forum International* as President of the ISHRS. It has been the finest honour of my professional career to serve this Society that we call our own. It is the pursuit of honest scientific knowledge in a sharing, friendly, and inclusive environment that makes the ISHRS so special. This is the heritage that Drs. Dowling Stough and O'Tar Norwood left us when they started it all twelve years ago.

The Society has taken a collective breath this year, taken another look at all its functions, its Code of Ethics, its Bylaws, its meetings and workshops. We are a more mature Society now so our processes and mechanisms need to reflect that maturity and the world in which we operate today. It reminds me of the airline pilot checking everything, testing everything before letting loose with the jet engines and taking off. There is so much talent coming through the ranks of the ISHRS

wanting to serve and help our Society that it will literally take off like a jet plane in the next few years. So many more people will then benefit from sharing our knowledge.

I wish to thank all our committees, in particular the chairpersons whose work often goes unnoticed. Please continue to contribute to our great Society. The Annual Scientific Meeting Committee of Drs. Ed Epstein, Sharon Keene, Paco Jimenez-Acosta, Bernie Nusbaum, Jim Harris, and Jerry Cooley and Betsy Shea deserve special mention. It looks like they have put together another outstanding learning experience for Vancouver in August. I look forward to seeing you all there, learning a lot, and kicking up our heels!

The ISHRS is in good shape. Our guidance from head office is sensational. Victoria Ceh and her helpers look after us like we were a member of their own family. I leave you comfortably in the hands of my good friend Dr. Tony Mangubat and wish him all the pleasures I have had during my term as President. ♦

Cheers,  
*Mario Marzola, MBBS*

## To Submit an Article or Letter to the *Forum* Editors

Please send submissions via a 3½" disk or e-mail, Remember to include all photos and figures referred to in your article as separate attachments (JPEG, Tiff, or Bitmap). For e-mail submissions, be sure to ATTACH your file(s)—*DO NOT* embed it in the e-mail itself. **We prefer e-mail submissions with the appropriate attachments.** Any person submitting content to be published in the *Forum* agrees to the following: 1. The materials, including photographs, used in this submission do not identify, by name or otherwise, suggest the identity of, or present a recognizable likeness of any patient or others; or, if they do, I have obtained all necessary consents from patients and others for the further use, distribution, and publication of such materials. 2. The author indemnifies and holds harmless the ISHRS from any breach of the above. *Send to:*

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*Submission deadlines:* September/October, August 10 • November/December, October 10

# Co-Editors' Messages



William M. Parsley, MD  
Louisville, Kentucky

The 12<sup>th</sup> Annual Meeting of the ISHRS is just about here and it is looking like another great meeting. I had a chance to talk to Dr. Ed Epstein, the Program Chair for this year's meeting.

Except for a little last minute shuffling that will inevitably occur, this year's lineup is set and he is quite pleased. Dr. Jim Harris is the Workshop Chair and the workshops look like they might be the best we have ever had, with a smorgasbord of topics dealing with subjects ranging from basic science to techniques, disease recognition and treatment, instruments, practice building, Board preparation, and much more. I looked them over and feel some disappointment that they couldn't be spread so I could attend all of them.



Michael L. Beehner, MD  
Saratoga Springs, New York

Assorted musings while sitting on my front porch:

**On "all-FU" vs combination grafting debates:** I find myself more and more reluctant to get into passionate debates

with "all-FU'ers" regarding the merits of including minigrafts (which are actually microscopically-cut DFUs and TFUs in our practice) in selected patients anymore. In fighting these battles, I feel a little bit like a Jehovah Witness trying to convert a Methodist. It's not worth the aggravation, doesn't accomplish anything, and both parties are probably better off continuing to use the method they have been using for years to get good results in their own hands. Aggressive marketing by some in our profes-

Remember, attendance is limited so look over the list and contact the ISHRS immediately to get into a workshop of interest to you.

Dr. Beehner's assistant, Betsy Shea, LPN, is the Surgical Assistant Program Chair. I know that Betsy will do a great job. Our assistants are vital to us and their continuing education and enthusiasm are most important to our practices. One of my personal favorite programs to attend annually is the Beginner's Program. (Hint: It's not just for beginners.) Once each year Jack Nicklaus would come back to Columbus, Ohio, to visit his golf teacher, Jack Grout. He would say, "Jack, I am a beginner and I want to start with the basics and go over my swing." If the best golfer the world has ever known can do it, we can too, and we will be the better for it. Drs. Sharon Keene and Francisco Jimenez-Acosta are running the Beginner's Program this year and have a terrific lineup of speakers. At the same time, Dr. Bernie Nusbaum will chair an Advanced Review Course,

along with the FU biases of most of the Internet hair sites, work against easily "selling" this approach to some patients, but I feel confident that in years to come, after more research and experience have gone by the dam, that the multi-FU graft will rightfully reclaim a respected position in the overall scheme of transplanting. Whoops, there I go getting myself all worked up and aggravated again! Gotta move on to something else....

**Recent New York Times article on hair transplantation:** The *Times* ran a very nice two-page article on advances in hair transplantation on Tuesday, June 15, 2004, in the "Science Times" section of the paper, along with excellent photos and diagrams to help explain the procedure. It is the kind of exposure that hopefully will go a long ways toward helping to erase in the public's mind the old image of detectable plugs on a bald scalp. It can also be viewed on the

supposedly for those at a slightly higher level. Both are great reviews for doctors at all levels. How frustrating for people such as myself who would like to attend both! Each year I probably take more notes in these sessions than in the rest of the meeting combined. While these sessions cater to less experienced or beginner doctors, there's nothing "beginner" about the speakers. They are a lineup of some of the best our field has to offer. Some of the "basics" and "fundamentals" in our field are somewhat subjective and it is always interesting to hear the opinions of these doctors.

I guess for me and for many of my colleagues, a highlight of this year's meeting will be the exposure to CAG (lateral) grafting. Vancouver is the home of Drs. Jerry Wong and Victor Hasson. They use a technique of making small densely-packed incisions oriented 90° to the intended hair direction of the graft (which is usually the same direction of the existing hair and at the same angle).

*continued on page 154*

Internet at the following address (you're going to need your pen for this one!): <http://www.nytimes.com/2004/06/15/health/15hair.html?page=1>.

**On "securing the home base":** Most of us who practice hair transplantation full-time have the burden of somehow making ourselves known to enough people out there to ensure a steady stream of patients that keeps us busy and our staff steadily working without layoffs. As I consider this topic, a number of thoughts come to mind that I think are worth sharing: I feel strongly that the most important marketing task for every hair surgeon is to nurture his or her home base. That is, if any person within your surrounding catchment area thinks about having a hair transplant, your practice should be visible enough (and hopefully have a good enough reputation) that he or she at the very least comes to you for a consultation

*continued on page 154*

# Notes from the Editor Emeritus



Richard C. Shiell, MBBS  
Melbourne, Australia

## Annual ISHRS Meeting

The year 2004 has passed with more than usual rapidity and now we are at Annual Meeting time again, albeit a couple of months earlier

than usual. (I understand that this is to get in some Canadian sightseeing before everything ices up for the winter.) There is much happening in our field and, as I did not attend any other meetings during the year, I am greatly looking forward to the Vancouver ISHRS Annual Meeting in mid-August.

## New Textbook

After 4 years of waiting the Unger/Shapiro textbook has arrived from the publisher, and I am sure that no one who has had the good fortune to see it will be disappointed. It is a wonderful achievement and a worthy successor to Dr. Unger's preceding three editions. I fully intend to review it when time permits but for the time being I urge you all to lodge an order and add it to your shelf of "must have" books. To the experienced hair surgeon or tyro, it will be as important as your dictionary or your Encyclopedia of general knowledge. Do not expect to read it in one sitting, however, as it has nearly 1,000 pages packed with the most carefully selected and edited information. There are some 30 contributors but no rubbish is allowed here, with every contributed line carefully vetted by Drs. Unger and Shapiro, with Editor's Notes attached where they wish to clarify or disagree with a point.

## Dr. Ron Shapiro

It was a delight to see Ron given the honor of a *Pioneer* biography in the May/June 2004 *Forum* (Vol. 14, No. 3, p. 89). While not one of the "grey beards" of our profession, he has a most

interesting medical background and he has filled these past 14 years with more creative activity than many can achieve in twice that time. Still young, and with his great energy and integrity, he is a man to watch in our Society over the years ahead.

## Orlando Meeting

This continues to be a highlight of the HT year thanks to the encouragement of MHR President, Dr. Matt Leavitt, and the enormous energy of Dr. David Perez-Meza. They are ably assisted by a bevy of experts who turn up year after year to run the Scientific Sessions, Workshops, and Live Surgery. This year the meeting was followed by the ABHRS examinations at which 11 candidates presented and 14 dedicated diplomates from former years were on hand to administer the Examination. I urge all serious practitioners of hair transplantation to attend the ABHRS and ISHRS Advanced Course in Vancouver and to consider taking this exam in 2005 or at some time in the future.

## Aegean Cruise

If you want a meeting with a difference, I draw your attention to the Annual DHI meeting that will be held at the Athens Clinic on October 3 and later during a 4 day Aegean cruise on board the ship *Olympic Countess*. The cruise will have stopovers in Mykonos, Kusadasi, Patmos, Crete, and Santorini. This year the main focus scientifically will be on FUE but the Greeks know how to enjoy life and once lectures end the fun begins. I have attended this meeting twice and would go every year if time permitted.

## Follicular Unit Extraction

After early derision by many doctors, this technique continues to attract attention as its place in the armory of HT procedures is assessed. A small number of practitioners practice follicular extraction exclusively, but an increasing number are using it for small

area transplants and scar repair. The outstanding article, "FUE Megasessions—Evolution of a Technique," by Drs. Bernstein, Rassman, and Anderson in the May/June 2004 *Forum* (Vol. 14, No. 3, p. 97) provides an excellent summary of how to perform FUE surgery and its possible role in hair restoration surgery.

While there are a small number of individuals who are obsessed with the possibility of bad donor scarring, this is in fact a fairly uncommon occurrence in the hands of experienced surgeons. FUE requires even greater surgical expertise so it is unlikely that the patient will be able to get a cheap FUE "fix" from his or her corner surgeon. The past and present members of NHI Group are to be congratulated for their ethical and unselfish sharing of their accumulated FUE knowledge with ISHRS members over the past 4–5 years.

## The Donor Site

Despite all the money and time being poured into cloning research and the development of better tissue preservatives, simple surgical matters, such as the management of the donor site, continue to be largely ignored. The matter is frequently debated in private on the Internet and in bars and corridors at meetings (often with more heat than light) but remarkably little scientific research has gone into methods of producing the optimum suture line.

Those of us who have been suturing the donor site for over 20 years all agree with certain facts, however:

1. Most donor sites heal with 1–2mm or less, whatever technique is used, even in the presence of moderate tension.
2. Women and older patients seem to get better scars.
3. The lower regions on the parietal and occipital site are more likely to produce wider scars.
4. A small subset of patients gets unsightly scars of 3mm or more, whatever technique is used, even

*continued on page 152*