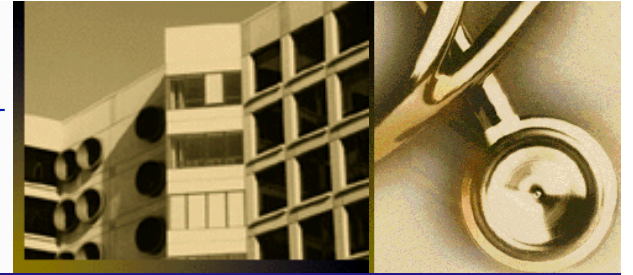




SOUTHWESTERN



**Defining the Role of Contact Cooling
During Non-Ablative Laser Therapy:
*Are We Over Cooling the
Target?***

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No potential conflict of interest relationships with regard to our presentation exist.

Status of FDA devices used for the material being presented

NA/Non-Clinical

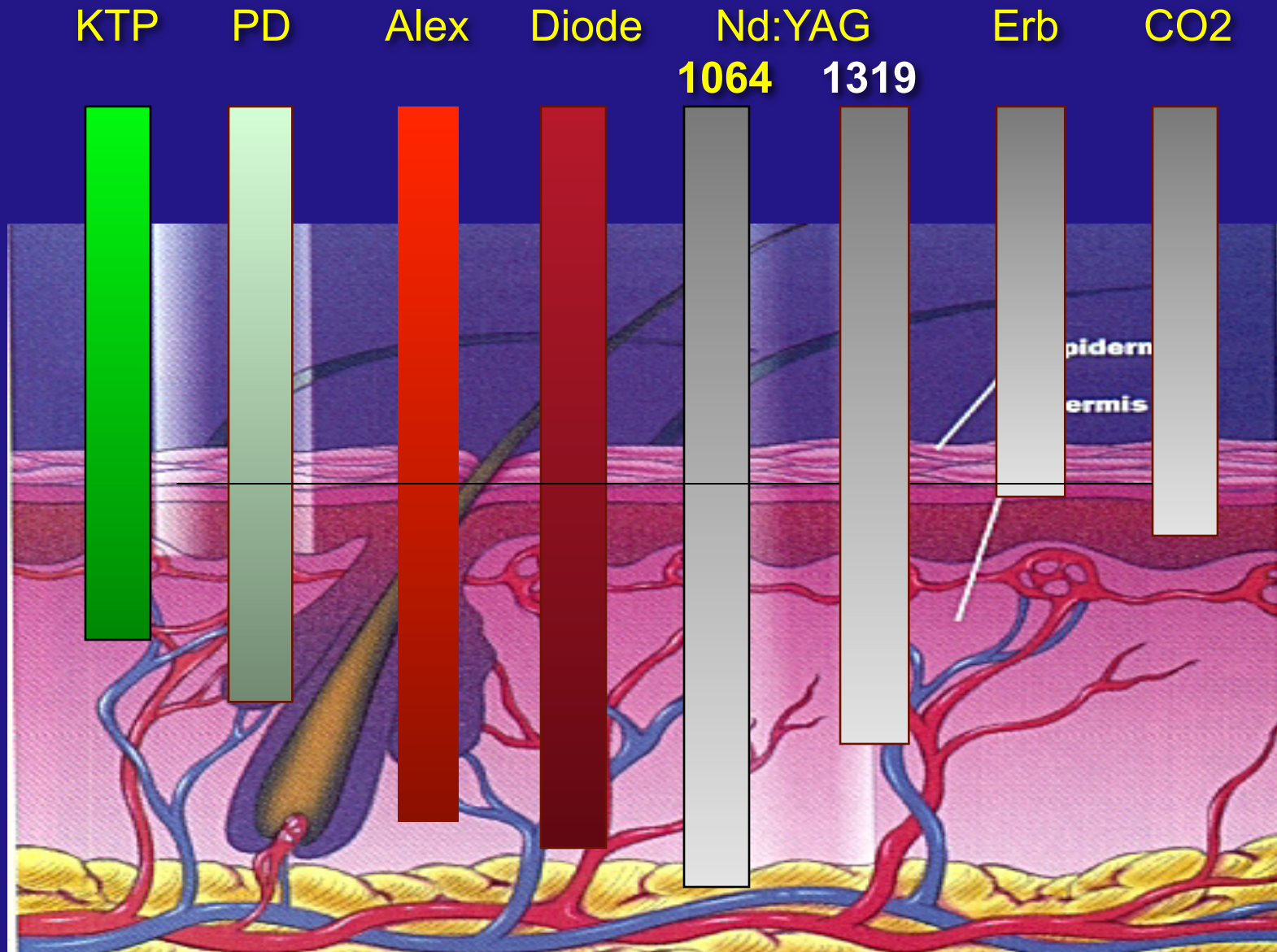
Status of off-label use of devices, drugs or other materials that constitute the subject of this presentation

NA/Non-Clinical

Treatment options



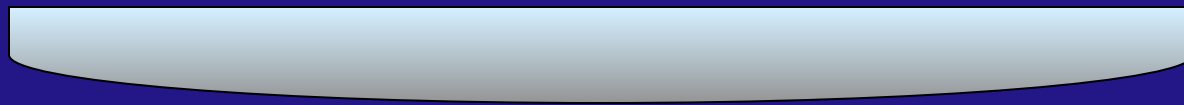
Depth of Penetration



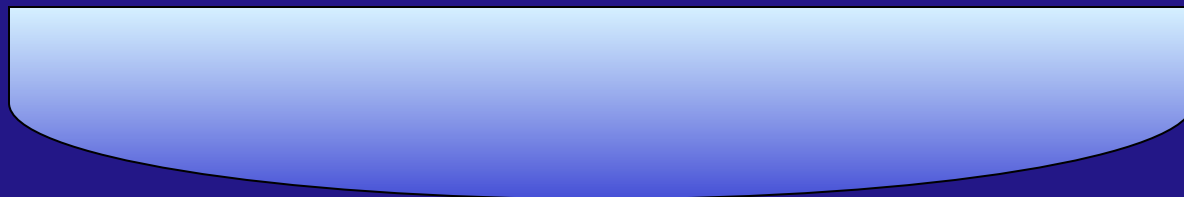
Effects of Contact Cooling

Superficial

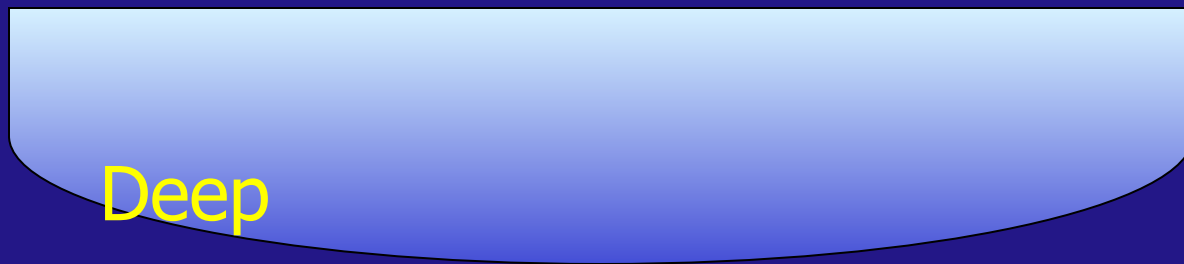
15°C



10°C



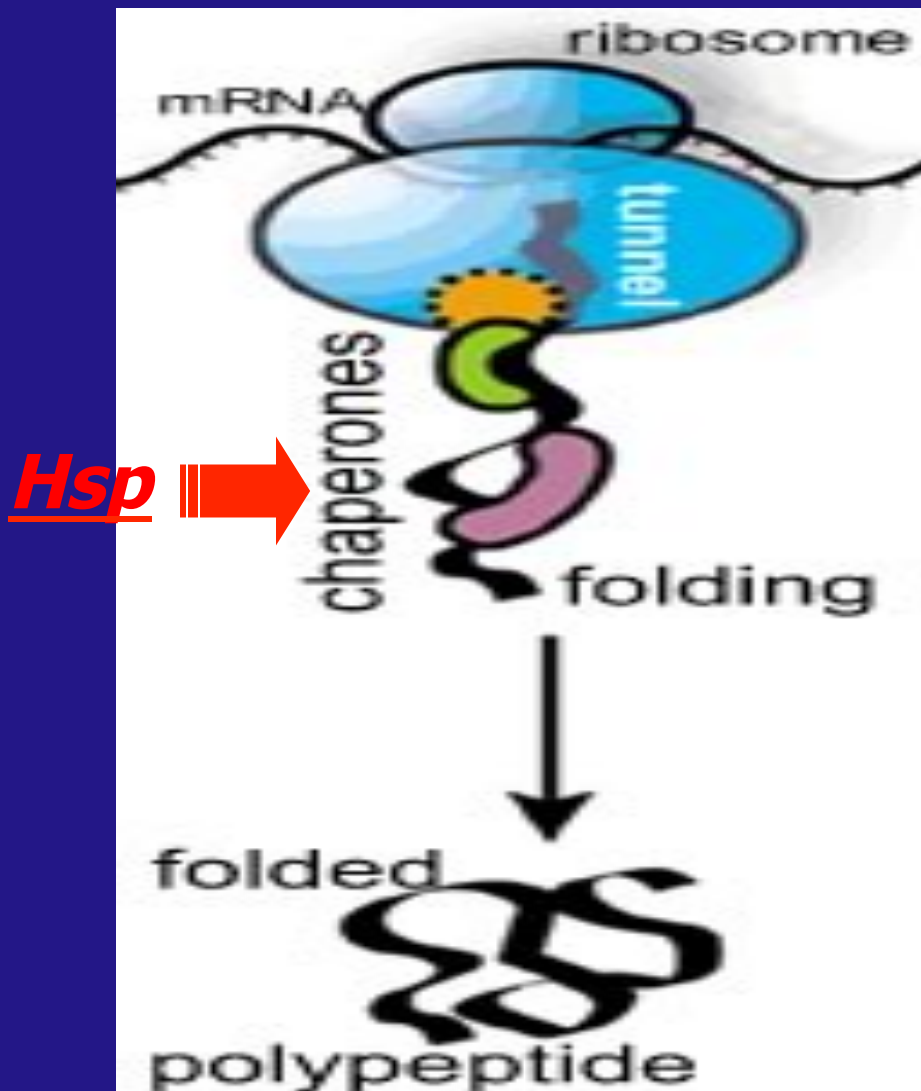
5°C



Deep

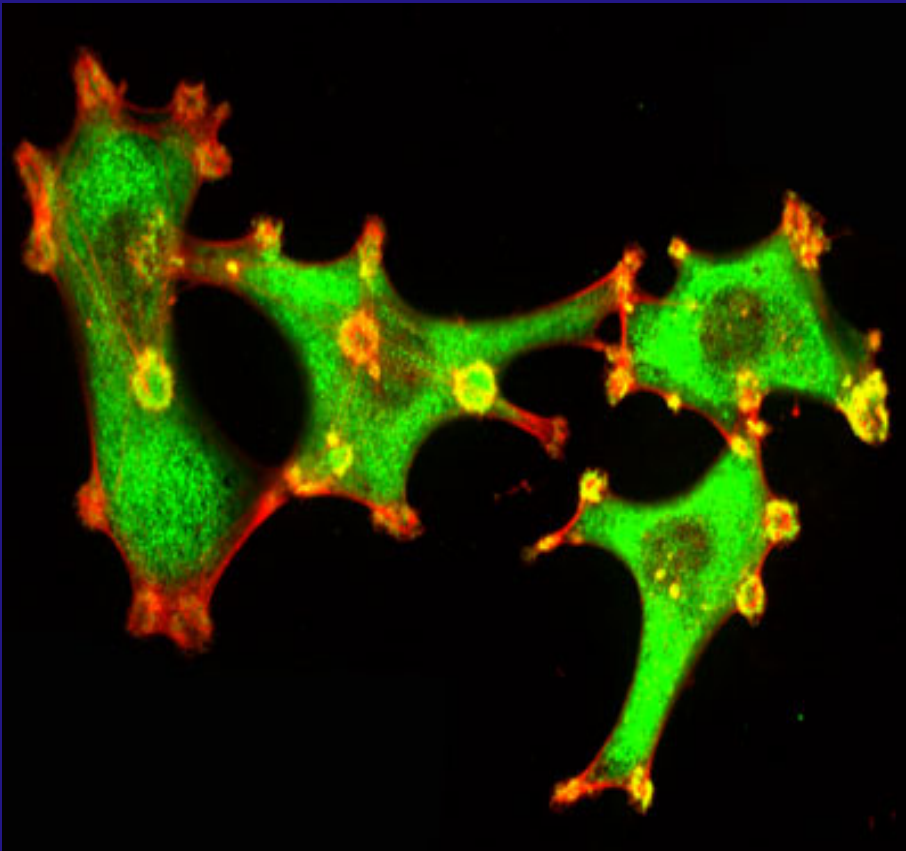


Heat shock proteins (Hsp)



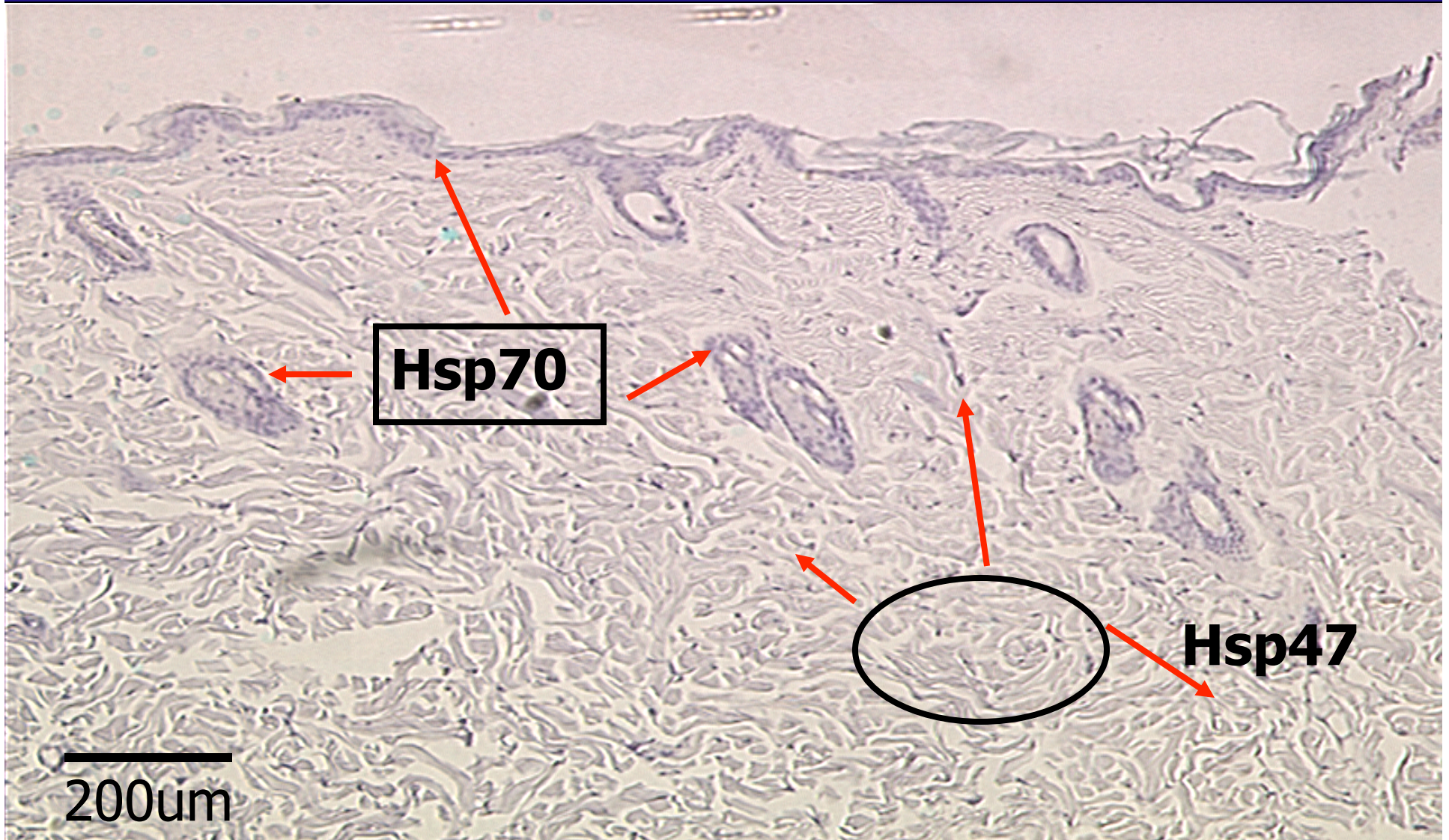
- Discovered over 40 years ago in fruit fly *Drosophila melanogaster*
- Expressed in response to “heat shock or cellular stress”
- Function as “molecular chaperones”
 - ✓ Refolding of damaged proteins
 - ✓ Synthesis of new proteins to replace irreparably damaged proteins

The Heat shock protein family

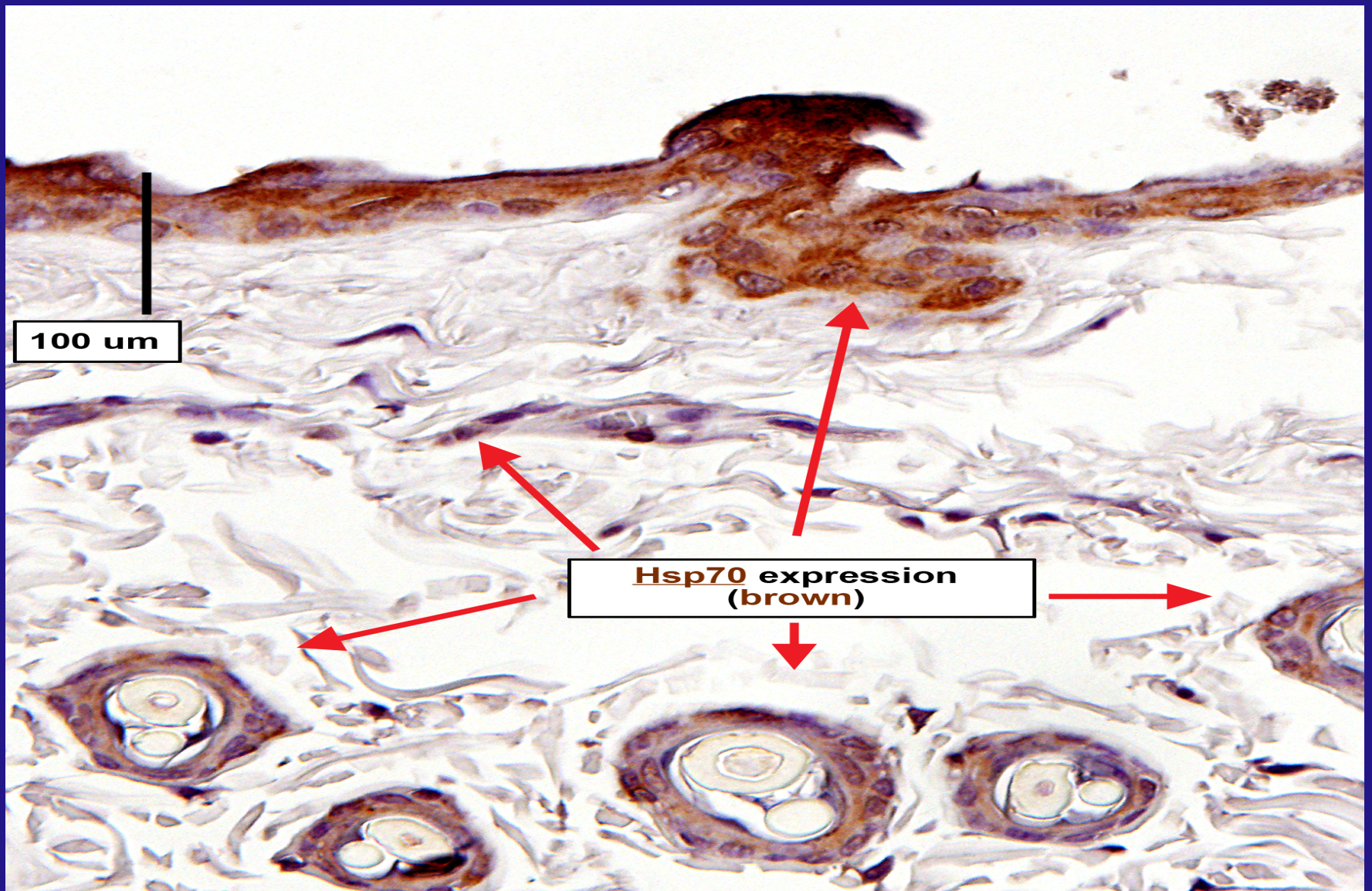


- Thermal/burn injury
- Ischemic/hypoxic changes
- Trauma
- Cardiac hypertrophy
- Fever/ Inflammation
- Metabolic poisons
- Cancer

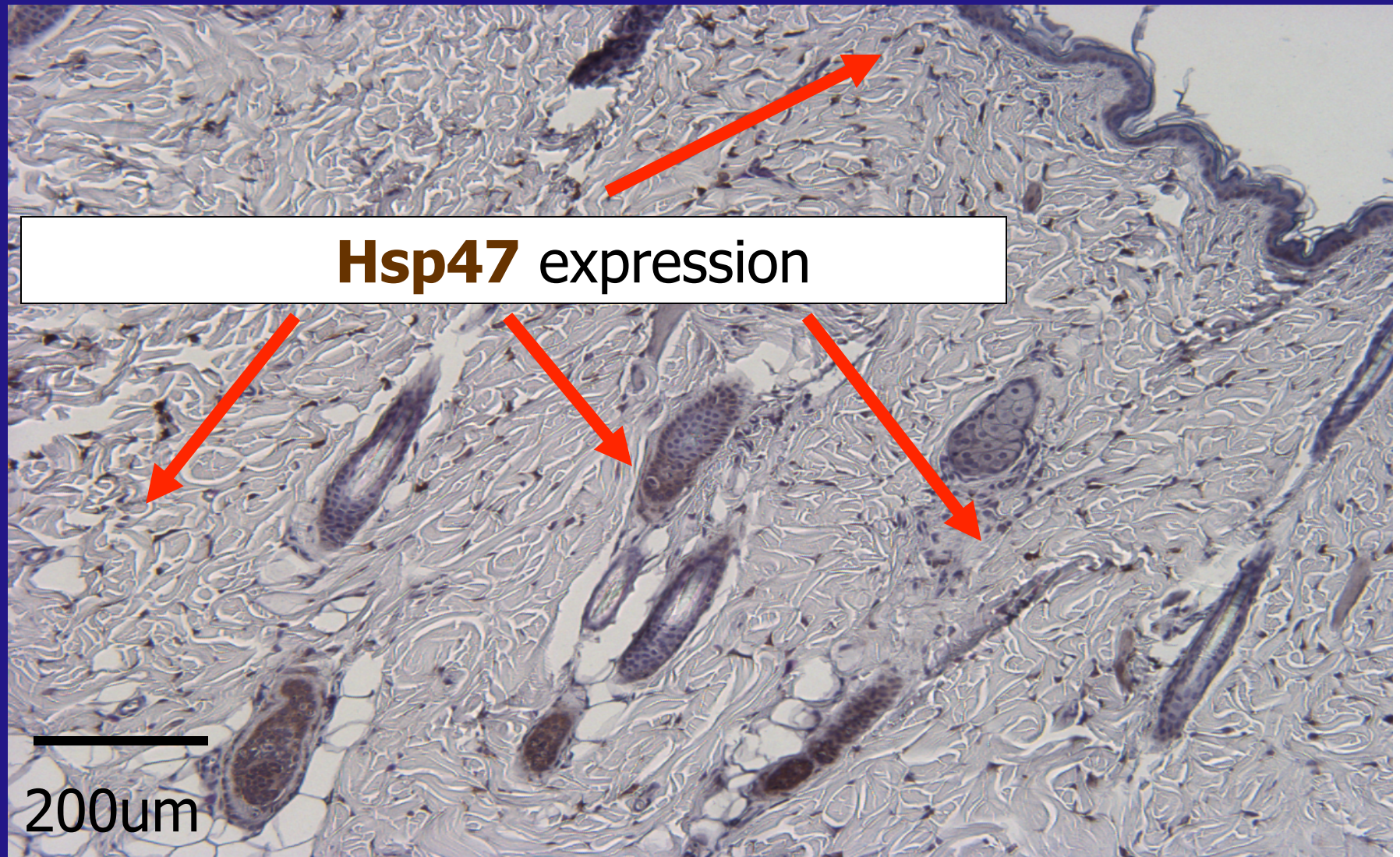
Hsp47 & *70* and skin



Hsp70 - expression at 8 hrs post laser without protective cooling

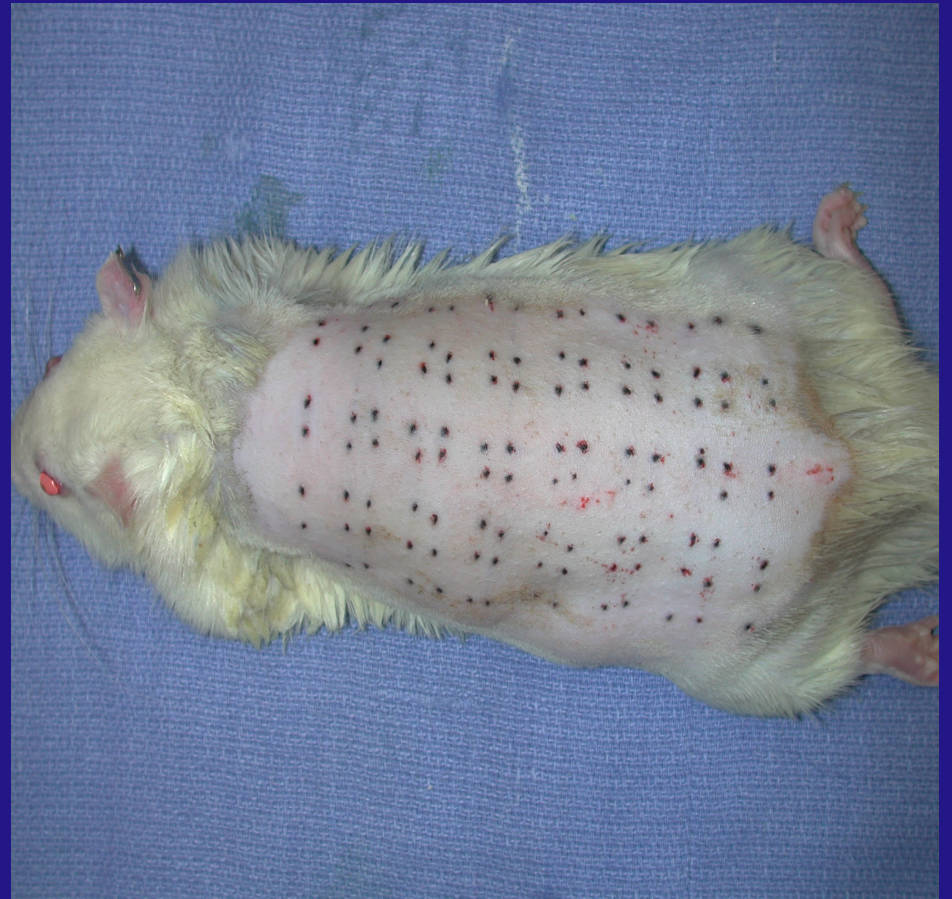


Hsp47 expression throughout the dermis with the 1319 Nd:YAG- 14 days post tx



Materials and Methods

- 18 Male Sprague Dawley rats were treated
- 1319nm Nd:YAG laser (Sciton, Inc.) with constant energy of 18J, and a 50ms pulse width to the dorsum of each animal.

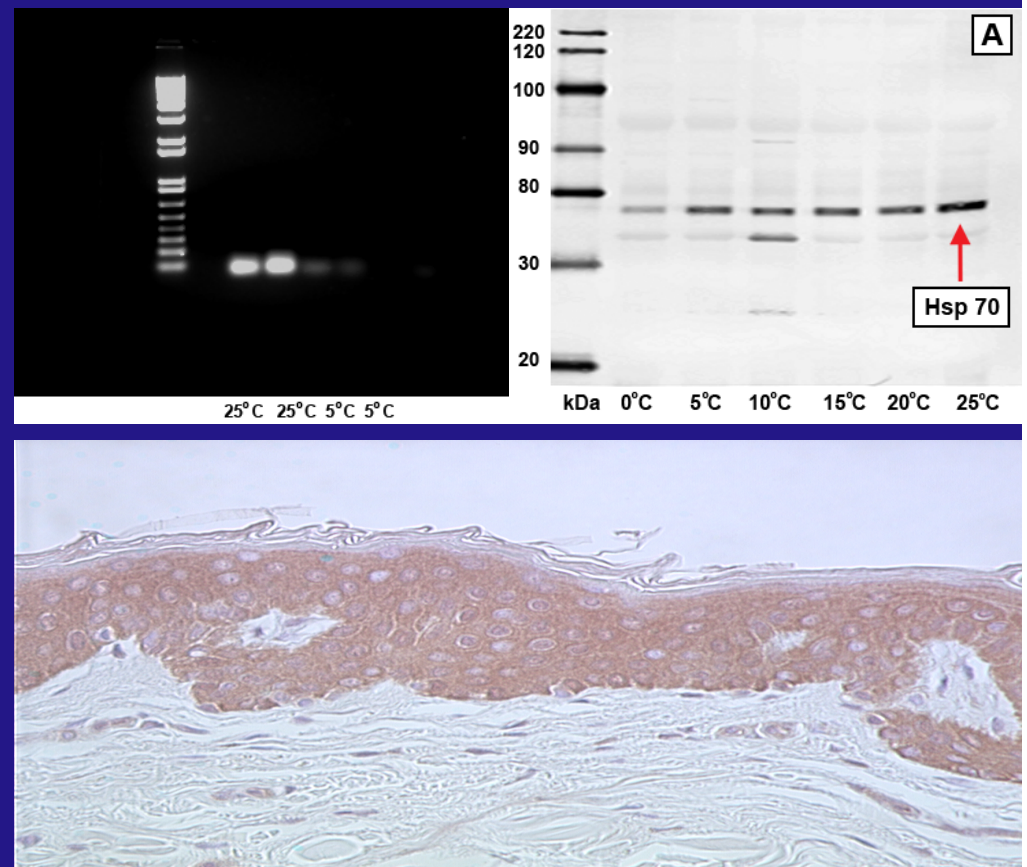


Contact Cooling

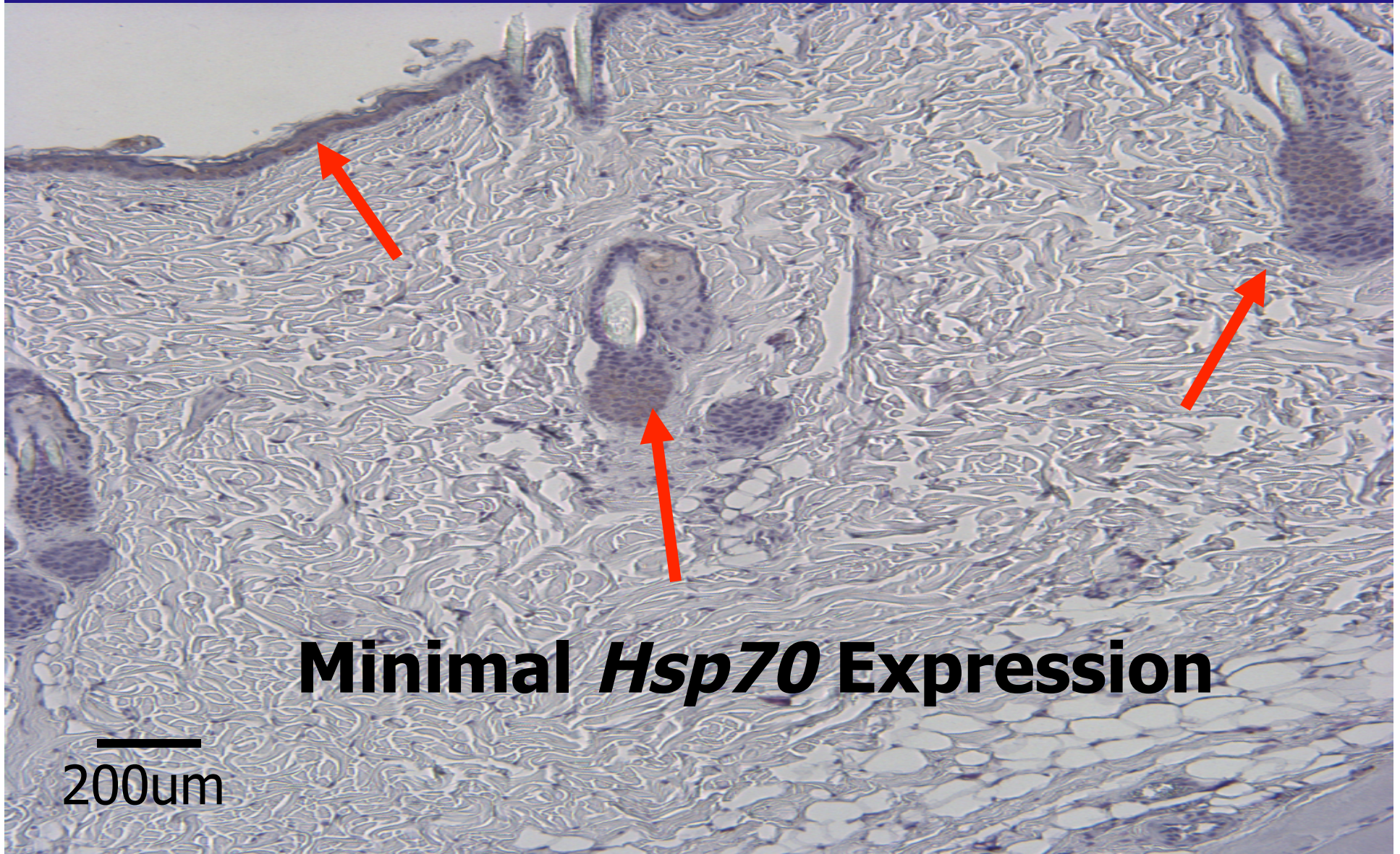
- **Sapphire plate contact cooling apparatus (Sciton, Inc.)**
- **Temperatures ranging from 0°C -25°C**
- **Approximately 2 seconds of pre-cooling at each temperature was instituted prior to each treatment**

Methods

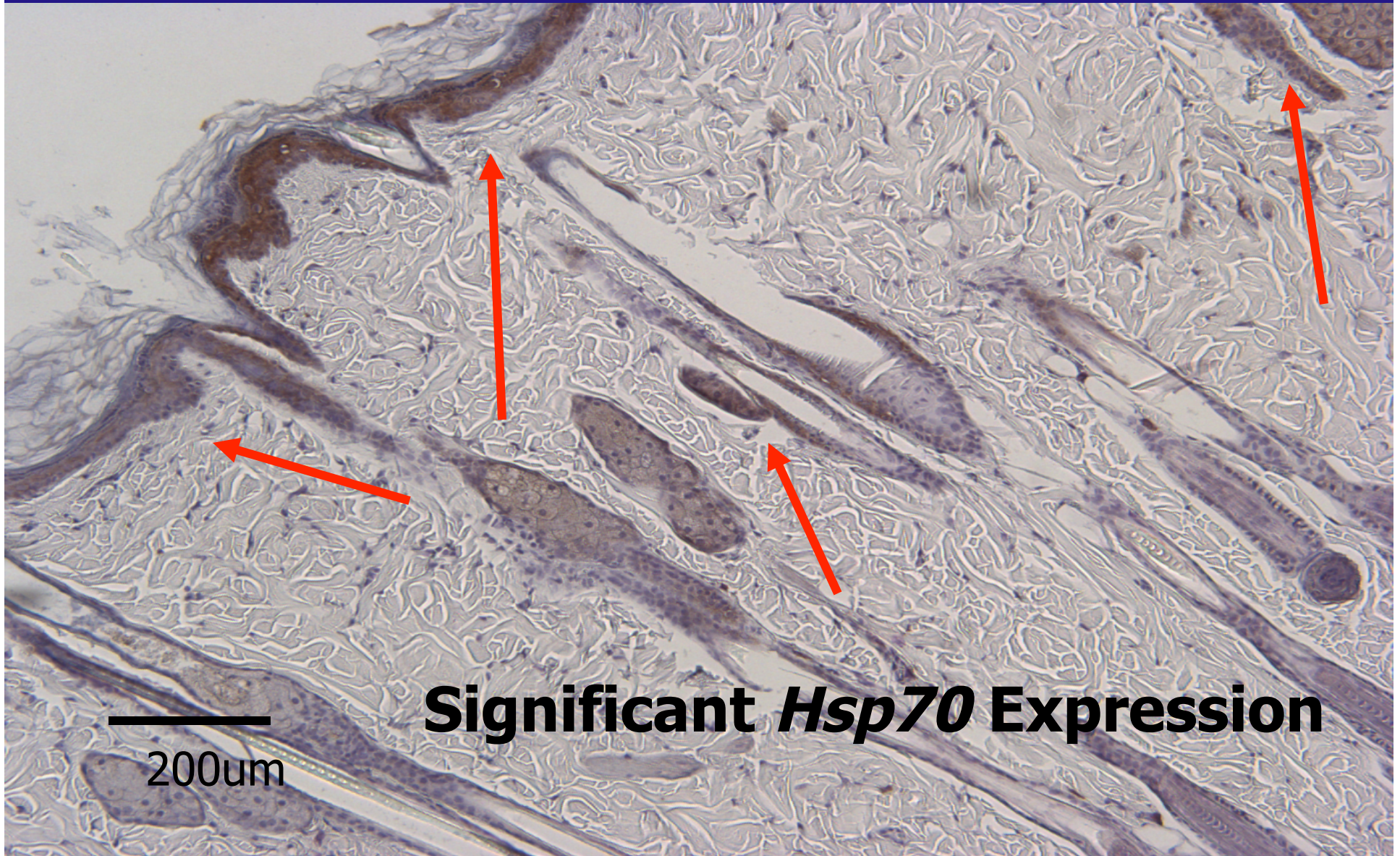
- Biopsies were obtained at multiple time points (2hr- 28 days)
- Tissues were analyzed:
 - for Histology and IHC
 - ELISA and ↓ Western blot
 - Real time PCR



***Hsp70* – Protective cooling to 5°C
with treatment at 18J/cm², 50ms**

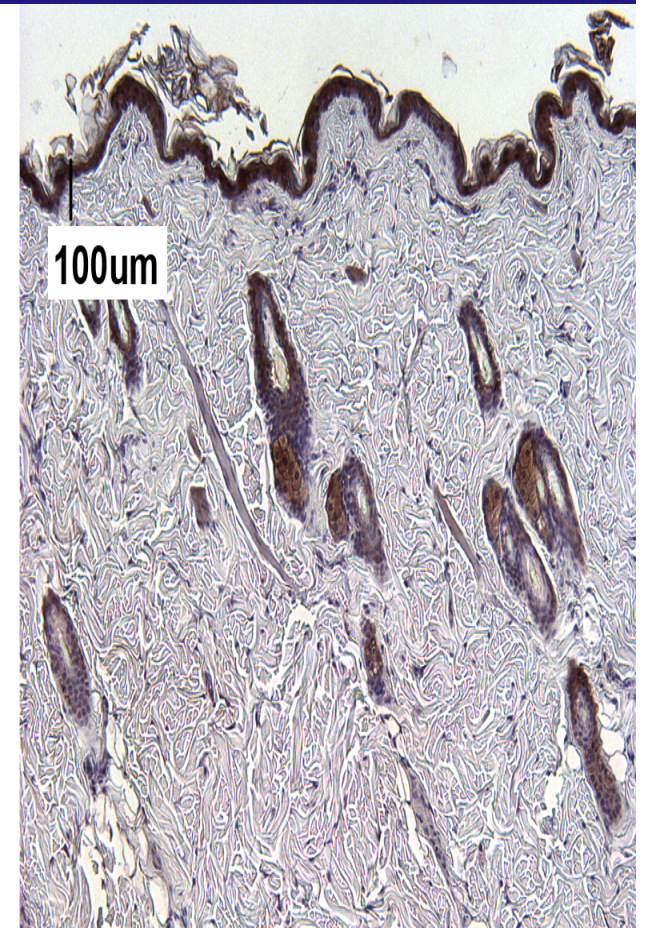


***Hsp70* - Protective Cooling to 13°C with 18J/cm², 50ms**

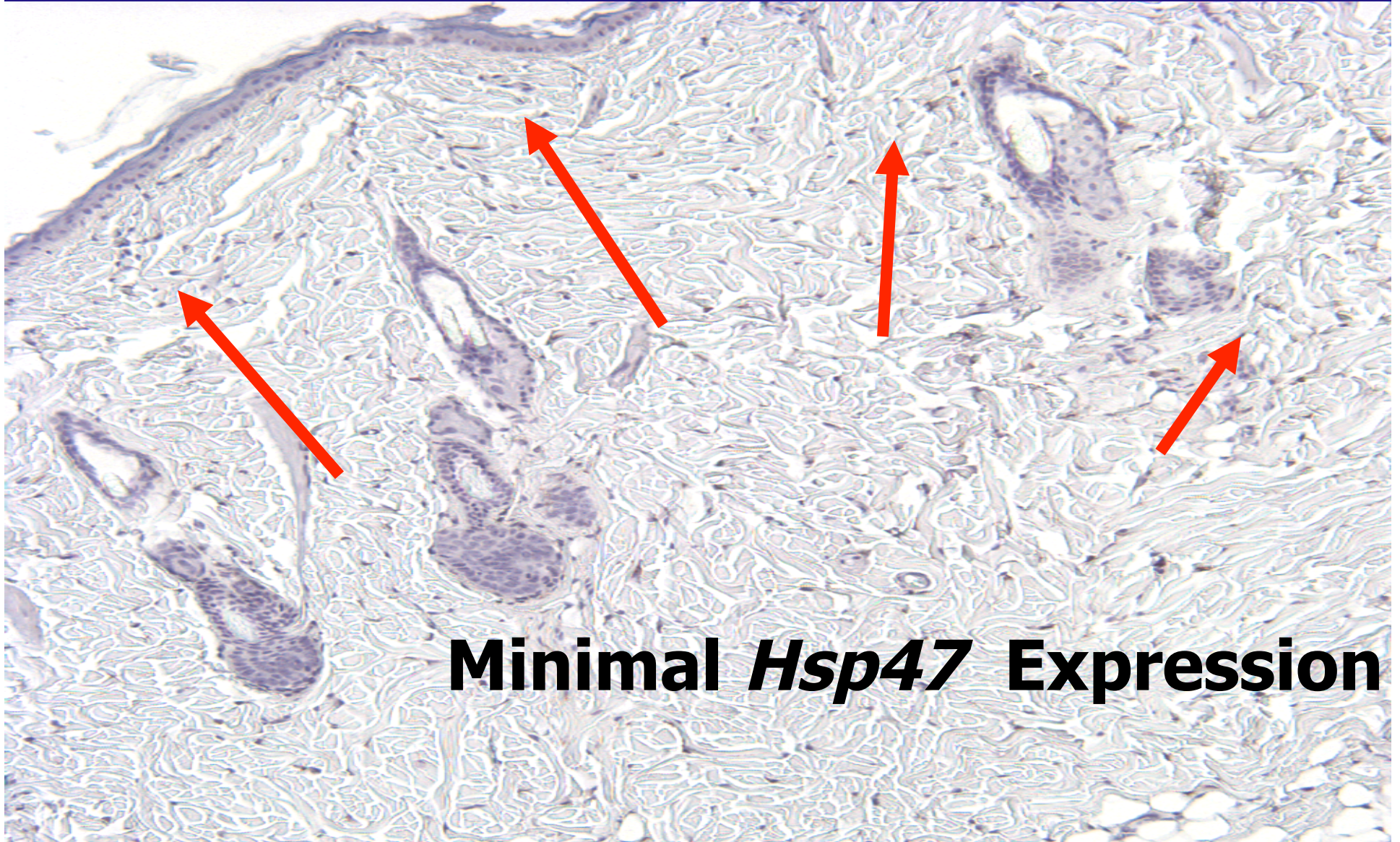


Protective Cooling- *Hsp70*

5°C → 14°C → 22°C

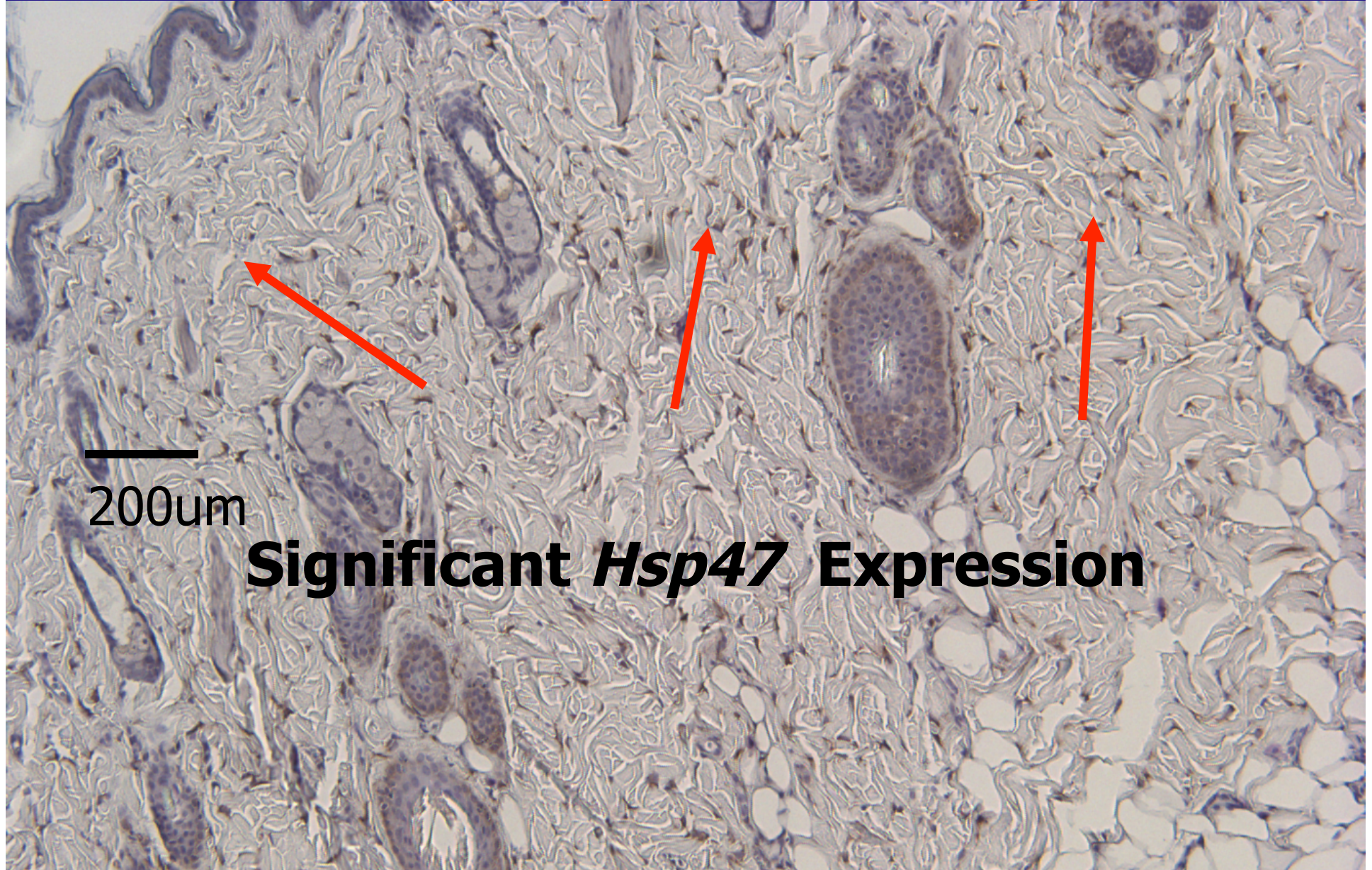


Hsp47- Protective Cooling to 5°C
with 18J/cm², and 50ms- 14 days



Minimal *Hsp47* Expression

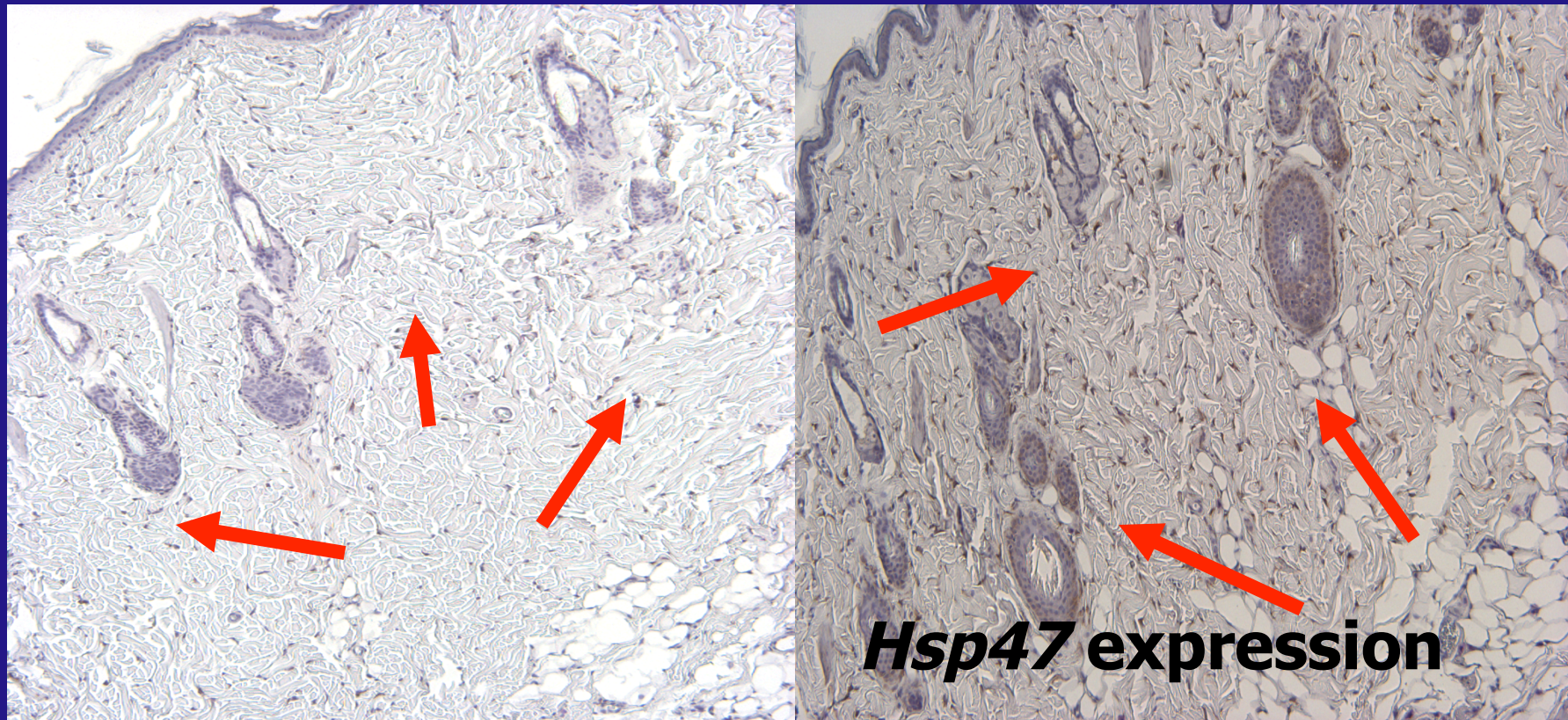
***Hsp47* - Protective Cooling to 21°C
with 18J/cm², 50ms- 14 days**



**1319nm Nd:YAG at 18mJ/cm² and
50ms**

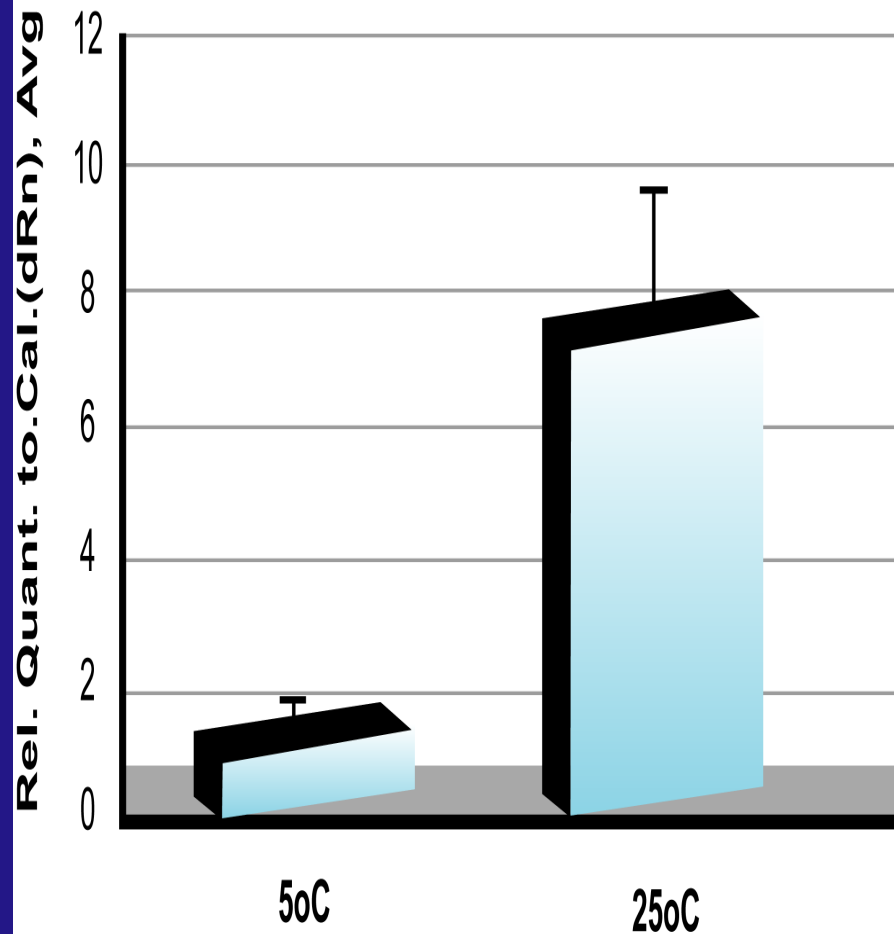
5°C

13°C

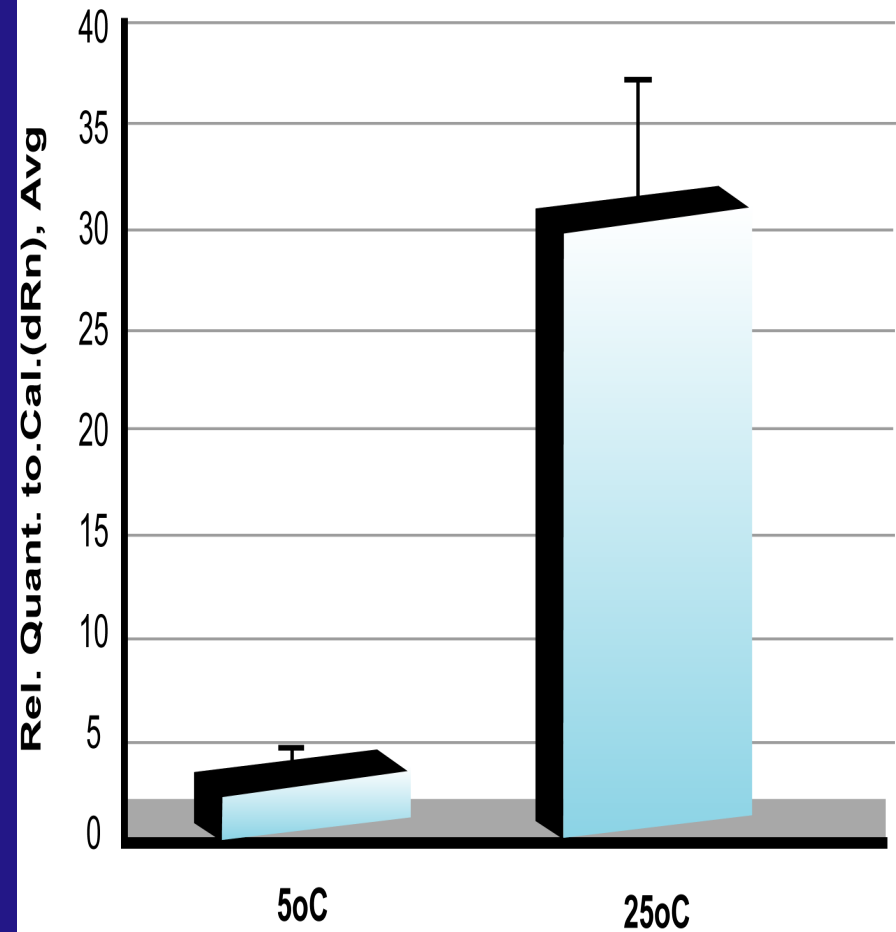


Real Time-PCR

HSP47 mRNA Expression



HSP70 mRNA Expression





Before



After

Conclusion

- Current recommendations for epidermal protection in non-ablative laser treatments is *0-5°C*
- We have demonstrated that this degree of protective cooling will adequately protect the epidermis *and* dermis in it's entirety

Future studies

- Human studies are currently underway
- Less protective cooling may lead to laser treatments requiring lower overall optical energies for non-ablative remodeling procedures



Thank You!