Using qRT-PCR and new patient samples, we validated induction of siRNA transient transfection caused a decrease in PIG1 cell number and an abnormal, senescent RHOJ RNA, and performed Whole Transcriptome RNA Sequencing followed by gene expression analysis. Using Ingenuity Pathway Analysis tool and our list of differentially expressed genes (P<0.05), we identified the RHO-GTPase (RHO) pathway as the top canonical pathway modulated by NBUVB in the bulge MCs (P<2.10^{-12}, enrichment score 2.78, and RHO/GTPase role in melanoma migration) as the top RHO component (P=4.4e-03; fold change (FC)=12.7). Using qRT-PCR and new patient samples, we validated induction of RHOJ and VM (P<0.05; FC=2) by NBUVB, and found a similar expression trend for BELA, CDH3, and CDH1. To study functional phenotypes associated with RHOJ depletion, we used the PIG1 immortalized MC cell line, which we identified as the functional model for human bulge MCs. RHOJ silenced cells showed a decreased proliferation rate and an abnormal cell cycle pattern; a decreased PIG1 cell migration (24%-P<3.6e-03) during the first 48h, as assessed by a scratch wound assay; a decreased expression of cytoskeletal proteins (focal adhesions and actin stress fibers; P<5e-04) de-acetylated by immunostaining. Our data suggest that RHOJ inhibition and migration of immure MCs, and is an important activator of these cells during NBUVB treatment.

**Impaired activation of SIRT3 contributes to oxidative-stress induced mitochondrial dysfunction: A possible mechanism underlying the degeneration of melanocytes in vitiligo**

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Mitochondrial dysfunction has recently been implicated in oxidative stress-induced melanocyte destruction in vitiligo. However, the specific molecular mechanism involved in this process has not been fully elucidated. Given the prominent role of the NAD+-dependent deacetylase SIRT3 in sustaining mitochondrial homeostasis and the fact that both the expression and activity of SIRT3 are decreased in vitiligo melanocytes, we therefore wondered whether SIRT3 plays an important role in vitiligo pathogenesis by regulating mitochondrial function. In the present study, we first found that both the expression and activity of SIRT3 was significantly decreased in melanocytes of vitiligo skin lesions compared with normal healthy controls. More importantly, the accumulation of oxidative stress in melanocytes was highly associated with the dysfunction of SIRT3 in vitiligo skin lesions. Then, we showed that vitiligo melanocyte cell line PIG1V was more vulnerable to H2O2-induced cell death compared with normal melanocyte cell line PIG1. Subsequent study revealed that the deficiency of SIRT3 activation in PIG1V cell line led to severe mitochondrial dysfunction and the release of cytochrome c to cytoplasm. Mechanistically, we showed that SIRT3 could deacetylate OPA1 and increase its function in regulating mitochondrial fission, thus reducing the release of cytochrome c to cytoplasm and cell apoptosis induced by oxidative stress. Taken together, our results have provided evidences that impaired activation of SIRT3 may contribute to oxidative-stress induced mitochondrial dysfunction and subsequent melanocyte degeneration in vitiligo.

**Randomized, single-blinded, split-face comparison of superficial chemical peel vs. Nd:YAG laser for the treatment of melasma**

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While both superficial chemical peels and Nd:YAG laser have been reported to be effective in melasma, there is a lack of side-by-side comparison studies. We prospectively compared chemical peels and laser for melasma at an urban, tertiary care university dermatology practice from January 2014 to January 2015. 20 women, age 18 and older, with at least a 2xcm patch of melasma on each side of the face (forehead or cheek), were randomized to receive 30% glycolic acid peel on one side of the face and 1064nm q-Switched laser on the contralateral side. Areas were pre-treated with 4% hydroquinone and 2.5% hydroxyconic cream. Procedural treatments were delivered at weekly or 2 and 6. Photographs were obtained at baseline, before treatment 1 (week 2), before treatment 2 (week 6), and at 10-week follow up. 18 patients were included. The outcomes of interest were significant improvement based on patient VAS scores, the scores were more painful than the laser; this finding was significant only for treatment 2. Participants were equally pleased with both treatments. Superficial chemical peels and Nd:YAG laser appear to be equally effective in the treatment of melasma.