There are a number of challenges that all formulators of topical products must overcome. (1) The patient needs to be able to transfer the product from the primary package to the site of treatment on the surface of the skin in an acceptable way. (2) Once on the skin surface the API needs to be able to penetrate through the complex microstructural barrier of the stratum corneum, or it may need to remain on the surface and not penetrate. (3) After the product has passed through the stratum corneum and is in the living layers of the epidermis it is important that the excipients not be irritating to the living keratinocytes and thereby trigger an inflammatory response, with redness, swelling, itching or burning. (4) All topical products need to be designed to deliver the active(s) to the appropriate biological compartment where it will have its effect.

The objective of these studies was to determine the allergy and irritation potential of oleochemical-based excipients that BASF markets for pharmaceutical dermal applications (e.g. creams, ointments, gels, foams, etc.), by clinical patch testing on patients who are being screened for allergies due to chronic episodes of dermatitis.

Patients, typically referred to Dr. Fowler’s office by fellow dermatologists, in some cases, travel from outside of Kentucky, due to limited clinics that provide patch testing (only 12 in North America). These patients have presented with dermatitis with an undetermined cause. Objective of testing is to evaluate whether the patient’s skin condition is caused or aggravated by a contact allergy. Data (excluding BASF excipients) is compiled by the Contact Dermatitis Society biennially.

**Exciipients Tested:**
- **Kollicare® 3C** – Cocoyl caprylocaprate Ph. Eur.
- **Kollicare® IPM** – Isopropyl myristate USP/NF, Ph. Eur.
- **Kollicare® OD** – Octyldodecanol USP/NF, Ph. Eur.
- **Kollicare® CP15** – Cetyl palmitate 15, Ph. Eur.
- **Kolliphor® PS60** – Polysorbate 60 USP/NF, Ph. Eur., JPE
- **Plurisol® E 400 NF** – Polyethylene glycol 400 USP/NF
- **Soluplus®** - Polyvinyl caprolactam polyvinylacetate polyethylene glycol graft copolymer

**RESULTS**

<table>
<thead>
<tr>
<th>Test Excipient (# of patients with 0 score)</th>
<th>Target = 500 patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kollicare® 3C</td>
<td>(500)</td>
</tr>
<tr>
<td>Soluplus®</td>
<td>(500)</td>
</tr>
<tr>
<td>Kolliphor® PS 60</td>
<td>(350)</td>
</tr>
<tr>
<td>Kollicare® IPM</td>
<td>(350)</td>
</tr>
<tr>
<td>Kollicare® OD</td>
<td>(350)</td>
</tr>
<tr>
<td>Kollicare® CP15</td>
<td>(350)</td>
</tr>
<tr>
<td>Plurisol® PEG 400</td>
<td>(350)</td>
</tr>
</tbody>
</table>

**METHOD**

- **Procedure for evaluation of chronic dermatitis causing agents at Louisville Dermatology Specialists.**
- Standard list of test substances applied to skin in Finn Chambers with Scanpore®Tape.
- BASF excipients were tested at 35% in petrolatum or water.
- Patches applied to patient’s back. Up to 70+ patches per patient (including BASF test materials)
- Post removal: test reading schedule
  - **48 hours:** will miss some positives, or they will be weaker than at 72 hr.
  - **48-72 hours:** best mix of catching the early and later reacting allergens
- **Later readings:** will miss some early reactors, but may pick up some slow reactors. Metals especially show late reactions.

**Scoring:**
- 1+ : Erythema, induration or papules (palpable)
- 2+ : Same as 1+, plus larger papules or early vesicles
- 3+ : Vesicular and/or spreading reaction

**CONCLUSION**

Topical product developers need to know that the materials they formulate with will not irritate the skin cells as they penetrate through the stratum corneum and into the living layers of the epidermis. BASF has sought to proactively demonstrate the mildness of our excipients. Clinical patch tests on patients who are demonstrating chronic and frequent episodes of dermatitis, have shown that selected excipients in the BASF Pharma portfolio did not elicit any irritation or allergy-related responses. Formulators should feel confident that when using these excipients they will not induce irritation or allergy in patients.