European legislation currently authorizes 15 sunscreen filters among which, there is only one natural filter: benzophenone. In light of this, new solutions of ingredients are needed. The goal of our work is to identify new ingredients that can be incorporated in sunscreen formulations and that are stable. Formulators and producers have been dealing with photostability, cancer control, and inflammation in the field of sunscreen cosmetics. However, these three aspects are not always present in the same formulation or product.

In this work, we present the results obtained with 11 molecules.

**Materials and Methods**

The molecules studied are presented in Table 1. They were incorporated into two sunscreens: an absorbed filter (phenylbenzimidazole sulphonic acid, PABA) and a selective filter (benzophenone-3, BP-3). Photostability in both UVB and UVA range was then determined according to the difference in photoprotective action. The SPF (sun protection factor) and PF-UVA (photostability factor) measurements were taken with a spectrophotometer with an appropriate support (PMMA plates, 25 cm²).

The molecules tested were then compared to the values obtained with currently authorized filters in order to determine their effectiveness. SPF and PF-UVA by using an in vitro method which we developed by adapting the work of Monnin et al., 2007b).

**Results**

In terms of UVA activity, if we compare the molecules tested against authorized molecules, we can see that the best performing is benzophenone-3 with a PF-UVA of about 2.5. Here too, all the molecules tested fit inside this range.

The results obtained for SPF are presented in Table 2. Three sunscreen agents (PABA filter, BP-3 and avobenzone) are available on the market and approved by Suntest, an international association that develops sunscreen standards. Each molecule is compared to these three filters in order to determine its efficiency. SPF levels obtained range from 1.66 for benzylidene camphor to 20.00 for anisotriazine.

Furthermore, we have also studied a combination of molecules. This photostability problem is not prohibitive since nearly 70% of commercial filters (meaning 12/18) are not photostable and therefore must be used in combination.

**Conclusion**

The natural environment seems to offer possibilities for finding new molecules with sunscreen potential. Certain chemical families like the flavonoids appear to be particularly interesting. Furthermore, we discovered that all the molecules tested, with the exception of ethyl ferulate, have a broad action spectrum which is interesting with respect to the current regulatory framework.