

DNA stability data from studies using silica gel capsules with Isohelix DNA SK-1 buccal swabs.

Introduction:

DNA buccal swabs provide a convenient, cost-effective alternative to invasive venopuncture for the collecting DNA for clinical genotyping, diagnostics, paternity or forensic testing and population studies as well as veterinary genotyping and diagnostics.

Other advantages of DNA buccal swabs include their use by untrained individual clients, patients or owners, as well as qualified professionals in clinics or hospitals.

DNA stability on swabs has been well documented and allows for sufficient time for the swab to be returned to the laboratory within a short to medium period, without undue breakdown of the DNA. If however the swabs need to be stored for longer periods prior to being returned to the lab, then storage at -20C has generally been considered the method of choice. In other situations where no freezer facilities are available, other methods such as air drying or using stabilising solutions are frequently used. Air drying is considered easy to use but is considered time consuming and has the disadvantage of potential contamination during the drying phase.

The use of stabilising solutions (like Isohelix DSK) does provide extremely long term stability (over 2 years), however it is advised that due to the nature of the components used, the kits should be handled by trained personnel.

We propose that the use of silica gel capsules (Isohelix type SGC/SK1) can be used as a viable alternative, offering reduced handling times and risks of cross contamination whilst providing a simple and effective way of stabilising long term, the DNA samples on the swab.

Method:

Multiple swabs were taken from individuals using Isohelix SK-1 swabs and stored in their tubes at room temperature with and without a silica gel capsule for a period of 5 months prior to analysis.

The stability of the DNA was assessed by isolating the DNA from swabs using the Isohelix DDK-50 kit and running samples of the DNA on agarose gels.

In addition, samples of the isolated DNA were checked for quality using the Isohelix DQC-50 PCR Kit which is a multiplex PCR reaction specifically designed to check the quality and presence of human DNA in the isolated samples.

The DQC kit is designed to produce fragment sizes of 100, 200, 300, 400, 500 and 600 bp. If all 6 fragments are observed, the DNA is not denatured, fewer than 6 bands indicates the DNA is partially degraded. The 500bp fragment is derived from an internal control, and should always be present even in negative controls, to show that the PCR reaction has been successful.

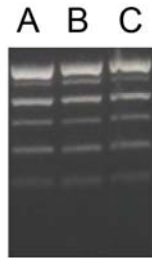
Results from 5 month study:

A+ = with capsule
A- = without capsule
B+ = with capsule
B- = without capsule
C+ = with capsule
C- = without capsule

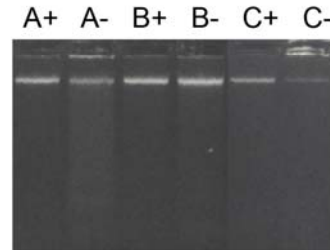
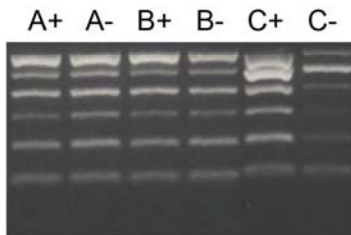
PCR using DQC-50
(Isohelix DNA quality check kit)
Multiplex PCR producing
6 fragments

DNA Loaded onto
Agarose Gel

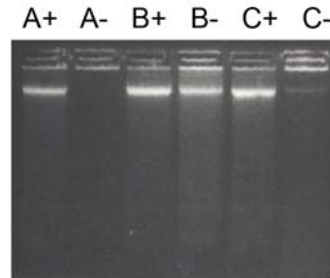
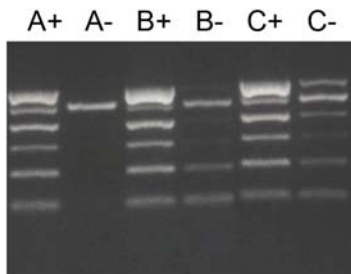
Fresh DNA
Day 0



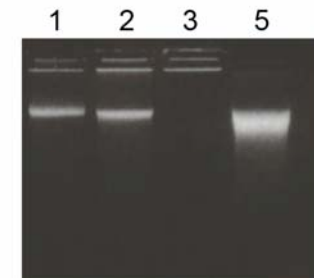
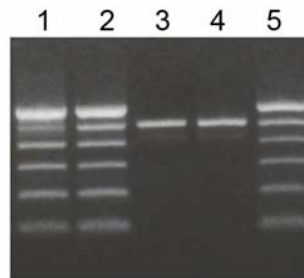
Swabs stored for
7 days



Swabs stored for
1 month



Swab stored
for 5 months



1 = Fresh swab
2 = with capsule
3 = without capsule
4 = -ve control
5 = Human DNA +ve control

Conclusions:

For long term stability requirements the additional use of Isohelix type SGC/SK1 silica gel capsules for buccal swab sampling proved to be a reproducible and viable alternative to other methods of stabilising DNA such as air drying, freezing and chemical stabilisation. This study clearly demonstrates that DNA stability can be substantially increased, in excess of 5 months. The study is ongoing and is expected to confirm an increased period of stability well in excess of the 5 months tested so far.

SK-1 swab with tube and silica gel capsule



As well as increased storage times, the silica gel capsules used together with the SK-1 tubes have other significant advantages in reducing the risk of cross contamination between samples, by allowing the swab samples to be stored separately from one another in their own individually identifiable tubes immediately after sampling. This is an important factor when the isolated DNA is likely to be used in downstream procedures such as PCR where contamination of the DNA is to be avoided.

Other Cell Projects Products

- **Isohelix DNA Buccal Swabs.**
High yields, blood alternative, reproducible, easy to use, different formats for various extraction methodologies.
SK-1, SK-2, SK-3 and SK-4
- **Isohelix DNA Isolation and Handling kits**
DNA stabilising kits for the stable storage of DNA at room temperature for long periods DSK-3/50
DNA isolation kits optimised for high yields of intact DNA from buccal swabs. DDK-3/50
- **Isohelix DNA Quality Check Kit**
PCR kit to confirm quality of DNA prior to onward experimentation DQC-10/50
- **Isohelix Buccalyse Kit**
A quick and simple one tube method for extracting PCR-ready DNA from buccal swabs. BEK-25/SK1

Cell Projects specialise in buccal cell DNA sampling and isolation technologies and offer a range of Isohelix products together with full technical support in this area. Further technical application notes are available to download from www.isohelix.com

For further information on any of our products please contact Cell Projects technical support at info@isohelix.com