

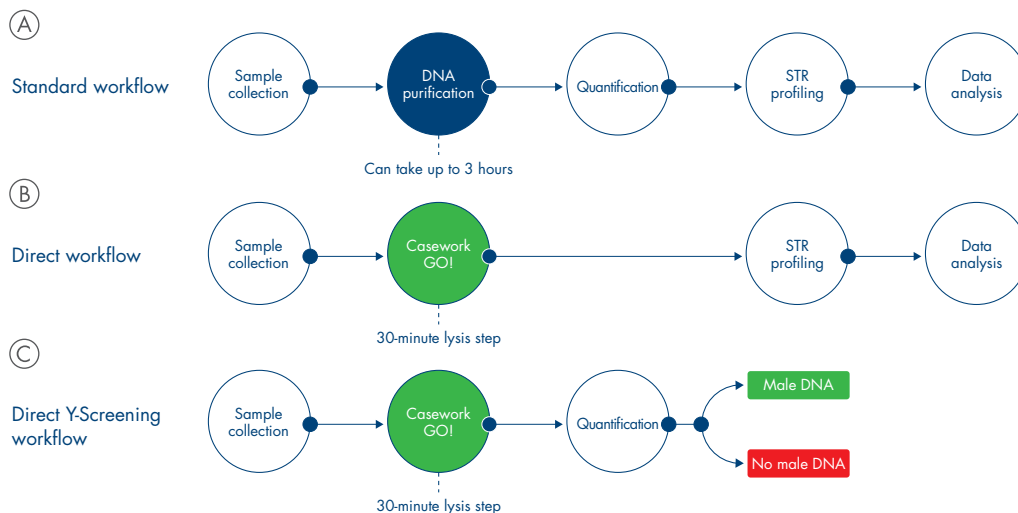
## Investigator<sup>®</sup> Casework GO! Kit

### GO! direct – from PCR-ready lysates to downstream STR amplification

The Investigator Casework GO! Kit is used for direct amplification of casework samples and thus enables an accelerated workflow in casework analysis (Figure 1A–B). It enables rapid processing of swabs from casework samples, including cuttings of sexual assault swabs, pieces of fabric, paper, cigarette butts, chewing gum and other sample types, without the need for further purification. The lysate can be used directly for quantification using all Investigator Quantiplex<sup>®</sup> assays (e.g., Investigator Quantiplex Pro and Quantiplex Pro RGQ) or in STR amplification using all Investigator STR assays (e.g., Investigator 24plex QS, ESSplex SE QS or 26plex QS) unless data from quantification indicates the presence of possible PCR inhibitors.

In sexual assault screening analyses, the Investigator Casework GO! workflow can facilitate sample processing decisions based on male DNA quantification result and Auto/Y ratio (Figure 1C).

- Maximize recovery of DNA from trace or touch samples
- Reduce hands-on time and cost
- Screen sexual assault samples to enable triage
- Make informed decisions with an integrated Quality Sensor

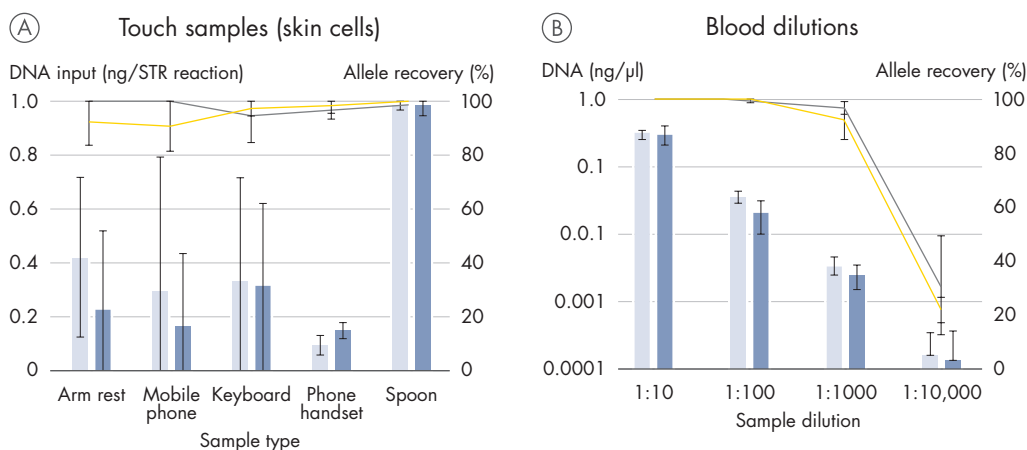


**Figure 1. Comparison of standard workflow and Investigator Casework GO! workflows.** The standard workflow requires DNA purification, which can take up to 3 hours, depending on the method or instrument used. Samples for the Investigator Casework GO! workflows are lysed in a thermal shaker for 25 minutes at 60°C and 900 rpm with 100–400 µl Casework GO! Lysis Buffer, which contains proteinase K. If sperm cells should be lysed, use the buffer containing DTT. The samples are then heat inactivated for 5 min at 80°C. The lysates are compatible with quantification or downstream STR assays.

## Rapidly process challenging forensic casework samples

Various studies have demonstrated a significant loss of DNA during conventional extraction from trace samples, compared with other high abundance samples. Inadequate DNA yield and concentration from trace samples leads to lower success rates in downstream analyses. In particular, the binding and washing steps are more likely to result in lower recovery of DNA in the final eluate. The Investigator Casework GO! Kit generates amplification-ready lysates in about 35 minutes without any binding or washing steps, or associated DNA loss, enabling higher success rates with challenging trace samples (Figure 2). Examples of trace DNA samples that benefit from direct amplification following pre-treatment with the Investigator Casework GO! Kit include:

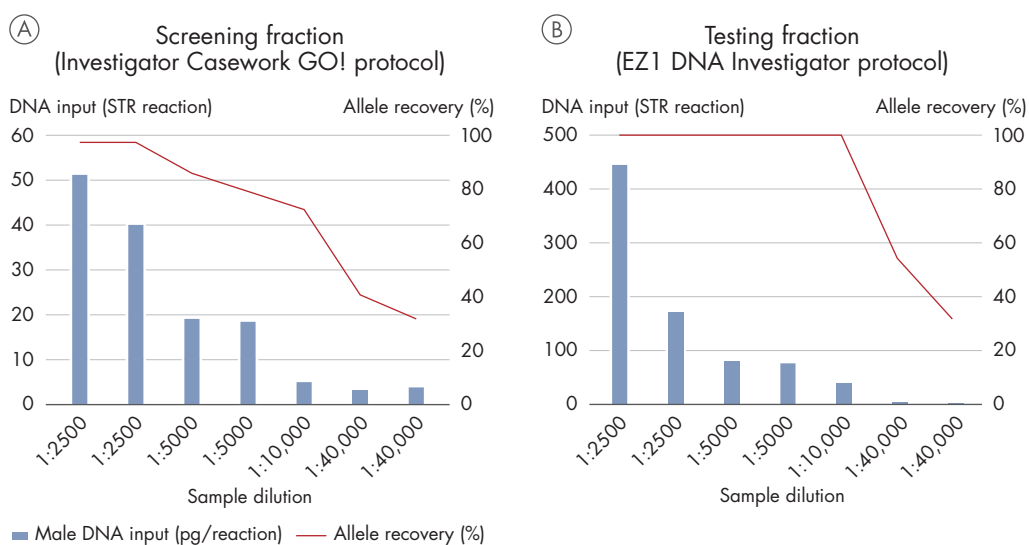
- “Touch” DNA
- Swabs from stained fabric
- Epithelial skin cells



**Figure 2. Recovery from casework samples.** The data demonstrated that direct amplification after Investigator Casework GO! treatment returned a better allele recovery rate and DNA yield (mean human) at the lower end. **A** Recovery from different surfaces: Chair arm rests, mobile phones, phones, key boards and spoons were swabbed evenly with pre-moistened cotton swabs (n=5). **B** Recovery from blood dilutions: Samples of 25 μl of diluted blood were put onto whole cotton swabs (n=6). Method: lysis was done in a volume of 200 μl for Casework GO! or in 500 μl Buffer G2 (elution in 100 μl TE) for EZ1 purification. Samples were quantified using the Quantifiler® Pro Kit on the Applied Biosystems® 7500 Real-Time PCR System, 1 ng/reaction or 15 μl sample was used for STR analysis with the Investigator 24plex QS Kit on the Applied Biosystems 3500 Genetic Analyzer.

## Rapidly process sexual assault evidence for Y-screening

Sexual assault samples require specialized extraction procedure to separate sperm from the victim's DNA. Moreover, the laborious nature of this workflow has resulted in an increase in laboratory backlogs. One approach to reduce these backlogs is to triage samples that are more likely to generate successful results, while at the same time, determine the optimal downstream analysis method to increase the likelihood of obtaining useful information about the perpetrator's DNA. Male DNA quantification result and Autosomal/Y ratio can be used as the basis for screening sexual assault evidence samples, thus simplifying and accelerating the workflow. The same Investigator Casework GO! lysate can be used directly for both quantification and amplification.



**Figure 3. Comparison of allele recovery from sexual assault kit (SAK) samples after screening with the Investigator Casework GO! protocol then testing with EZ1.** Semen dilutions (25  $\mu$ l) were put onto swab heads. The samples were resuspended by shaking at room temperature for 5 min in 400  $\mu$ l Casework GO! Lysis Buffer without proteinase K or DTT. A Screening to identify samples more likely to generate successful results: For the screening protocol, the designated screening fraction of the sample volume (10%; 40  $\mu$ l) was removed and lysed in the presence of proteinase K and DTT according to the Investigator Casework GO! protocol. B Testing: The remaining 90% (360  $\mu$ l) was designated the testing fraction and was lysed for 1 hour at 60°C with proteinase K and DTT according to the EZ1 large volume protocol, but without the addition of Buffer G2. After the addition of 400  $\mu$ l Buffer MTL, the EZ1 samples were purified and eluted in 40  $\mu$ l TE on the EZ1. All samples were quantified using the Quantiplex Pro Kit on an Applied Biosystems 7500 Real-Time PCR System and a 1.5  $\mu$ l sample was used for STR analysis with the Investigator 24plex QS Kit on the Applied Biosystems 3500 Genetic Analyzer.

**Table 1. Technical specifications of the Investigator Casework GO! workflow**

Compatible plasticware	2 ml tubes; ideally safe-lock
Recommended volume per reaction	100–400 µl
Storage conditions of lysate	Lysate can be stored at 2 – 8°C for short term (up to 1 week), or at –15 to –30°C for long term
Compatibility with collection devices	Please check the leaflet

## Ordering Information

Product	Contents	Cat. no.
Investigator Casework GO! Kit	Casework GO Lysis Buffer, Proteinase K Solution, and Nuclease-Free Water	386546
DTT (1 ml)	1M DTT; forensic grade; for sperm cell lysis	1117316
Investigator Quantiplex Pro Kit (200)	Primer Mix, Reaction Mix, Control DNA M1, Nucleic Acid Dilution Buffer	387216
Investigator Quantiplex Pro RGQ Kit (200)	Primer Mix, Reaction Mix, Control DNA M1, Nucleic Acid Dilution Buffer	387316
Investigator 24plex QS Kit (100)*	Primer Mix, Fast Reaction Mix 2.0, Control DNA, Allelic Ladder 24plex, DNA Size Standard 550 (BTO), Nuclease-Free Water	382415
Investigator 26plex QS Kit (100)*	Primer Mix, Fast Reaction Mix 3.0, Control DNA, Allelic Ladder 26plex, Nuclease-Free Water	382615
Investigator ESSplex SE QS Kit (100)*	Primer Mix, Fast Reaction Mix 2.0, Control DNA, Allelic Ladder ESSplex SE QS, DNA Size Standard 550 (BTO), Nuclease-Free Water	381575

\* other kit sizes available

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at [www.qiagen.com](http://www.qiagen.com) or can be requested from QIAGEN Technical Services or your local distributor.

Investigator Kits are manufactured in alignment with the ISO 18385 standard.

For faster time to result with viable samples, visit [www.qiagen.com/casework-go](http://www.qiagen.com/casework-go).

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