



# GENOMIC DNA FROM PLANT TISSUES

## Principle steps in the Nucleon<sup>®</sup> Plant genomic DNA protocol

Breaking of Cell Wall

Cell Lysis with Potassium/SDS

DNA Extraction with Nucleon  
PhytoPure<sup>®</sup> Resin

DNA Precipitation

DNA Washing

- High speed (<60 minutes)
- High yield ( $\geq 60\mu\text{g}/1\text{g}$  Tissue (pea))
- High purity ( $A_{260/280} > 1.8$ )
- High MWt DNA (>50kb)
- No phenol, chloroform or Proteinase K
- Patented chemistry to ensure polysaccharide-free DNA preparations
- Fully scalable (0.1g-1.0g)

### Introduction

The Nucleon Plant genomic DNA extraction system has been developed to rapidly and efficiently extract high molecular weight DNA from plant tissue. It is designed to eliminate concerns over the use and disposal of chloroform.

The kit is capable of producing high yields of high quality DNA in a fraction of the time taken by conventional methods. Not only is it more efficient, but it is considerably simpler.

Polysaccharides are common contaminants in plant DNA extracts often resulting in difficult to handle, 'slimy' DNA pellets. This problem is compounded by the fact that polysaccharides, particularly those of an anionic nature, can be inhibitory to further enzymatic analysis of the DNA. The Nucleon PhytoPure DNA extraction system has been developed specifically to solve these problems.

### Principle

After breaking of the cell wall, the cells are lysed in a reagent containing potassium/SDS which is known to complex with proteins and

polysaccharides. The Nucleon PhytoPure proprietary resin is then added. This resin performs two vital functions during the extraction process. It covalently binds polysaccharides with free  $-B(OH)_2$  groups on its surface, thus removing them from the sample. Additionally, the resin forms a semi-solid stratum during partitioning which facilitates DNA recovery, ensuring high yields of high quality DNA (Table 2).

The Nucleon Plant genomic DNA extraction system is not based on a column format. As a result, scaling up to large sample volumes is both simple and cost effective.

### Applications

DNA recovered by the Nucleon Plant DNA extraction system is suitable for restriction digests (Figure 1), PCR<sup>†</sup> (Figure 2), blotting and hybridisation.

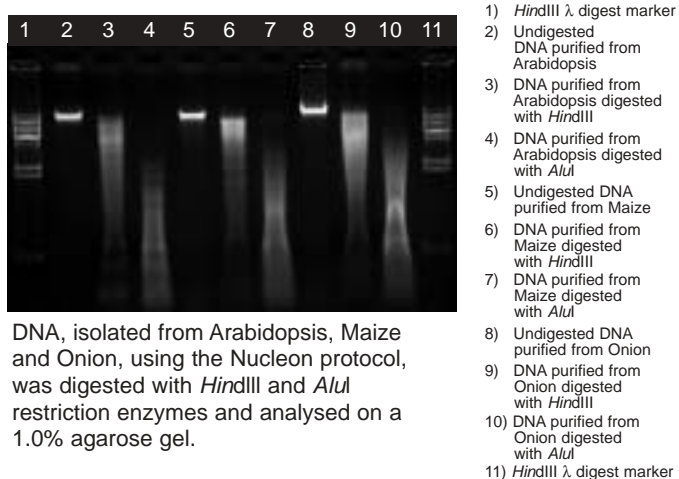
The Nucleon Plant genomic DNA extraction kit has been used successfully on a wide range of plant species (Table 1). DNA can be extracted from fresh, frozen or freeze-dried material.



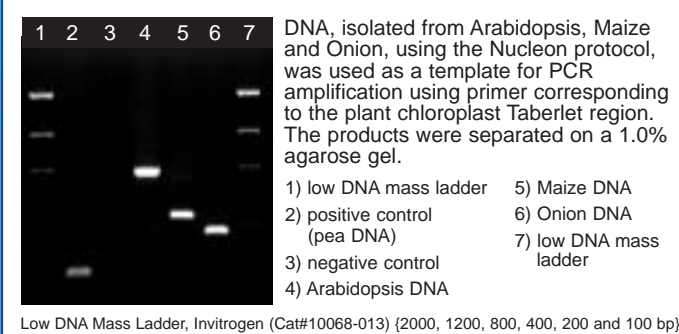
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**Figure 1** Genomic DNA isolation and restriction enzyme digests



**Figure 2** PCR Amplification



**Table 1** Species from which DNA has been extracted using Nucleon PhytoPure resin

<i>Arabidopsis thaliana</i>	<i>Lycopersicon esculentum</i> (tomato)
<i>Araucaria araucana</i> (Monkey puzzle tree)	<i>Musa spp</i> (banana)
<i>Beta vulgaris</i> (sugar beet)	<i>Malus spp</i> (apple)
<i>Brassica oleracea</i> (cabbage family)	<i>Nicotiana tabacum</i> (tobacco)
<i>Brassica napus</i> (oilseed rape)	<i>Phaseolus vulgaris</i> (red kidney bean)
<i>Capsicum annuum</i> (chilli pepper)	<i>Pinus sylvestris</i> (Scots pine)
<i>Capsicum frutescens</i> (sweet pepper)	<i>Pisum sativum</i> (pea)
Cereals (barley, maize, rye, wheat)	<i>Rhododendron spp</i>
<i>Cocos nucifera</i> (coconut)	<i>Salix spp</i> (willow)
<i>Cryptomeria</i> (Japanese cedar)	<i>Solanum tuberosum</i> (potato)
<i>Eucalyptus globulis/grandis</i>	<i>Sorghum</i> seeds
<i>Fragaria x anannassa</i> (strawberry)	<i>Sphagnum</i> (bog moss)
<i>Fucus</i> (brown seaweed)	<i>Spinacea oleracea</i> (spinach)
<i>Gossypium hirsutum</i> (cotton)	<i>Swietenia macrophylla</i> (mahogany)
<i>Helianthus annuus</i> (sunflower)	<b>Filamentous Fungi:</b>
<i>Helianthus tuberosus</i> (Jerusalem artichoke)	<i>Aspergillus niger</i>
<i>Heavea braziliensis</i> (rubber)	<i>Mortierella alpina</i>
<i>Humulus lupulus</i> (hop)	<i>Colletotrichum gloeosporioides</i>
<i>Irvingia gabonensis</i> (mango)	<i>Septoria nadorum</i>
<i>Lolium</i> (ryegrass)	<b>Nematode:</b>
<i>Lotus japonicus</i>	<i>Rhadopholus similis</i>
<i>Lupinus albus</i> (lupin)	<b>Slugs</b>
	<b>Snails</b>

**Table 2** Recoveries of DNA from various plant tissues

Sample	Yield of DNA ( $\mu\text{g}/\text{mg}$ tissue)	Average $A_{260/280}$
Pea	>60 $\mu\text{g}/\text{g}$	>1.8
Maize	>10 $\mu\text{g}/\text{g}$	>1.8
Arabidopsis	>300 $\mu\text{g}/\text{g}$	>1.8
Onion	>60 $\mu\text{g}/\text{g}$	>1.8

### Ordering Information

#### 44300 Nucleon Genomic DNA Extraction kit for 50 extractions of 0.1g of plant tissue

Other kits available in the Nucleon range:

- SL8510** Nucleon PhytoPure kit for 50 extractions of 0.1g of plant tissue
- SL8511** Nucleon PhytoPure kit for 50 extractions of 1.0g of plant tissue
- SL8501** Nucleon BACC1 kit for 50 extractions of up to 1ml whole blood or cell cultures
- SL8502** Nucleon BACC2 kit for 50 extractions of between 3 to 10ml of whole blood or cell cultures
- SL8512** Nucleon BACC3 kit for 50 extractions of up to 10ml of whole blood or cell culture
- SL8508** Nucleon ST kit for 50 preps of up to 250mg of soft tissue
- SL8509** Nucleon HT kit for 50 preps of up to 25mg of hard tissue or paraffin-embedded sections
- 44100** Nucleon Genomic DNA Extraction kit for 5 preps of 10ml whole blood
- 44200** Nucleon Genomic DNA Extraction kit for 50 preps of 1cm mouse tail
- 44201** Nucleon Genomic DNA Extraction kit for 200 preps of 1cm mouse tail

Other kits available in the Nucleopure™ range for use with the Nucleopure Automated System for mouse tail DNA extraction:

- 35100** Nucleopure Mouse Tail kit for up to 960 extractions

Other kits available in the Nucleoplex™ range for use with the Nucleoplex Automated System for BAC/Plasmid DNA extraction:

- 33100** Nucleoplex Plasmid DNA extraction kit for up to 192 extractions
- 33200** Nucleoplex BAC DNA extraction kit for up to 192 extractions
- 33201** Nucleoplex BAC DNA extraction kit for up to 192 extractions (plasticware not included)